I-HISTORICAL DEVELOPMENT

II-DEMOGRAPHIC DATA

TEN-STATE
Nutrition Survey
1968-1970

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DHEW Publication No. (HSM) 72-8130

PREFACE

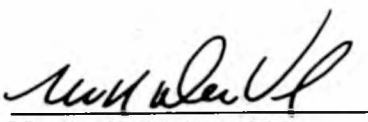
In the fall of 1967, Congress directed the Department of Health, Education, and Welfare to survey and identify the prevalence, magnitude, and distribution of malnutrition and related health problems within the United States. The Department designated the Nutrition Program, at that time headed by Dr. Arnold E. Schaefer, to conduct the survey.

The Program brought together several expert consultant committees in 1968 to identify the population groups and areas of the country where nutrition problems would be most prevalent, and to assist in the development of survey procedures. Primary emphasis was placed on lower income groups. However, the target areas also included middle- and upper-income groups.

The Program selected 10 states plus New York City as geographically representative of the major areas of the country, the broad diversity of economic, ethnic, and sociocultural composition, and availability of trained manpower to conduct such a survey. The work was accomplished through contracts with state health departments and university schools of medicine.

The survey collected five types of data: general demographic; dietary-intake; clinical and anthropometric; dental; and biochemical.

The results of this nutrition survey, the largest ever conducted, should be of value not only to Congress in its deliberations, but also to health workers in developing programs designed to alleviate the problems and concerns which the survey demonstrated.



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ACKNOWLEDGMENTS

Since its inception in 1968, hundreds of people (not to mention the thousands studied) have participated in the Ten-State Nutrition Survey. It is impossible to acknowledge the contributions of all of them in this space. Only those who were in position of greatest responsibility can be mentioned here.

The Nutrition Program professional staff who participated throughout the conduct of the survey were Arnold E. Schaefer, Ph.D., Chief, Ogden C. Johnson, M.D., Fred J. Payne, M.D., Miss Gretchen E. Collins, Mr. Samuel C. Marcus, Mary B. McCann, M.D., and Mr. Earl P. Schubert.

In addition to the Nutrition Program itself, other agencies within and outside the Department of Health, Education, and Welfare contributed to the Survey. As one example, the Ad Hoc Technical Advisory Committee, which was convened for the purpose of advising the Nutrition Program on the design of the survey, drew on the resources of the Department of Agriculture, Office of Education, Children's Bureau, Administration on Aging, Office of Economic Opportunity, Bureau of the Census, Bureau of the Budget, National Center for Health Statistics, and the National Center for Chronic Disease Control and staff from the Office of the Director, Health Services and Mental Health Administration. Special thanks are due to the staff of the Office of the Director, Center for Disease Control, for providing the support and resources needed for the preparation of this report, and to the present Nutrition Program staff for giving unstintingly of their time and effort. The Statistical Services Activity of the Nutrition Program, Mr. Kelly Hand, Chief, deserves particular recognition for their efforts.

Data collection was carried out either by the State Health Department of each of the ten states or by a designated state medical school. The agencies responsible, and their survey directors, are as follows:

California. State Department of Public Health, Beatrice Nold, M.D.

Kentucky. State Department of Health, Mrs. Joella Sisler Rhodes.

Louisiana. Tulane University School of Medicine Department of Tropical Medicine and Hygiene, Walter G. Unglaub, M.D. (dec.), and Patrick M. Morgan, D.V.M., D.P.H.

Massachusetts. State Department of Public Health, Health Research Institute, Joseph C. Edozien, M.D.

Michigan. State Department of Public Health, Mrs. Alice Smith.

New York City. State Department of Health, New York City Health Department, Robert G. Newman, M.D.

New York State. State Department of Health, Health Research Institute, John H. Browe, M.D. assisted by Donald M. Watkin, M.D.

South Carolina. State Board of Health, Malcolm U. Dantzler, M.D.

Texas. University of Texas Medical Branch, Galveston, William J. McGanity, M.D.

Washington. University of Washington School of Medicine, Nathan J. Smith, M.D.

West Virginia. State Department of Health, N. H. Dyer, M.D.

Special committees of the American Academy of Pediatrics, headed by Charles U. Lowe, M.D., and the Food and Nutrition Board, National Academy of Sciences-National Research Council, headed by D. Mark Hegsted, Ph.D., provided consultation during analysis of the data and preparation of this report.

We are grateful for the contribution of the many individuals mentioned above. However, the method of presentation and the interpretation of the data in this report is the responsibility of the staff of the Center for Disease Control.

Chapter I – HISTORICAL DEVELOPMENT OF THE TEN-STATE NUTRITION SURVEY 1968 – 1970

Chapter I

HISTORICAL DEVELOPMENT OF THE TEN-STATE NUTRITION SURVEY 1968-1970

LEGAL AUTHORITY

Congress included in the Partnership for Health Amendment of 1967 the requirement that information be obtained concerning the nation's problems of serious hunger and malnutrition. Congressional hearings early in 1967 pointed to the probability of the existence of these problems and the paucity of information about their prevalence and location.

Specifically, Section 14 of the Partnership for Health Amendments of 1967, approved December 5, 1967, provided that:

"The Secretary of Health, Education, and Welfare, in consultation and cooperation with other officials of the federal government and of the states, shall make a comprehensive survey of the incidence and location of serious hunger and malnutrition and health problems incident thereto in the United States and shall report his findings and recommendations for dealing with these conditions to the Congress within six months from the date of this section."

DEVELOPMENT OF NATIONAL NUTRITION SURVEY PROTOCOL

To meet the Congressional mandate, the Secretary of the Department of Health, Education, and Welfare designated the Nutrition Program, National Center for Chronic Diseases, Bureau of Disease Prevention and Environmental Control, Public Health Service, to carry out a National Nutrition Survey. Heads of agencies within the Department were asked to submit comments and suggestions on the conduct of the survey, and a meeting was convened with representatives from these agencies attending. As a result of these discussions, an Ad Hoc Departmental Technical Advisory Committee was appointed to advise the Nutrition Program on the design of the survey. This committee was chaired by Dr. Arnold Schaefer, Chief of the Nutrition Program, and had membership from the following agencies:

U. S. Department of Agriculture
Office of Education
Children's Bureau
Administration on Aging
Office of Economic Opportunity
Bureau of the Census
Bureau of the Budget
National Center for Health Statistics
National Center for Chronic Diseases

The Nutrition Program, in cooperation with the Ad Hoc Advisory Committee, developed a general protocol and sampling plan for the National Nutrition Survey. A number of technical working groups, composed of both governmental and nongovernmental consultants called together by the Nutrition Program, developed the specific survey procedures, which will be described later.

The general sampling plan was further refined by the statisticians from various agencies and through the incorporation of detailed sampling procedures worked out by the National Center for Health Statistics. The methodologies, procedures, and standards published in the ICNND *Manual for Nutrition Surveys*[1] were used as guidelines in developing and carrying out the survey and in interpreting the data collected.

The final guidelines and procedures developed specifically for the National Nutrition Survey are contained in Appendix I. They were designed to:

1. Establish uniformity in methods, techniques, procedures, and guidelines for conducting surveys.
2. Outline and define responsibilities and duties of the members of survey teams.
3. Provide a guide to interpretation of the dietary, biochemical, and clinical data collected.
4. Serve as a working reference of major facts essential to proper appraisal of nutritional status.
5. Aid in interpreting findings in order to draft practical, effective recommendations to alleviate the nutritional problems discovered.
6. Assist in training personnel in nutritional appraisal techniques, and stimulate continued nutritional efforts.

Several assumptions were made in order to select a sample that would provide the best infor-

[1] Interdepartmental Committee on Nutrition for National Defense. *Manual for Nutrition Surveys, Second Edition 1963.* Superintendent of Documents, Government Printing Office, Washington, D.C.

mation on the magnitude of the problem of malnutrition in the United States and yet be feasible within budgetary, personnel, and time constraints. The first premise was that malnutrition would be most prevalent in the poverty population. A second premise was that this poverty population could be identified in geographic areas, and that this clustering of the population would enable a probability sample to be selected based on poverty areas. Also, an assumption was made that within the poverty population one would expect nutrition problems to be found in certain special groups. These groups included: migrant workers; the Spanish-speaking population in the southwest; people living in the inner-cities of major urban centers; and individuals living in industrial states where a significant work force had moved from other parts of the country, particularly from the South, during the last 10 to 20 years.

CONDUCTING THE SURVEY

Scope

The Ad Hoc Advisory Committee concluded that it would be unrealistic to attempt to sample every state or to carry out a survey that entailed sampling thousands of areas spread randomly throughout the country. They also concluded that a series of random-sample surveys of states would be preferable to a single national random-sample survey. Accordingly, in early 1968, 10 states were judgmentally selected to provide a population representative of the target groups assumed to have a large number of poverty families and a high prevalence of malnutrition and associated problems. Additional criteria for selection of states included:

1. Geographic representation of major regions of the country.
2. Reflection of the broad diversity of economic, ethnic, and sociocultural composition of the country, such as rural, urban, and industrial.
3. Indication of desire to participate in the survey on official and professional levels.
4. Adequate resources in expertly trained manpower to conduct the survey.
5. Specific considerations such as a concentration of migrant labor, infant and maternal mortality rates above the national averages, and variations in types of food-distribution and welfare programs.

Within each state, special emphasis was given to the groups most vulnerable to nutritional stress, namely, infants, pregnant and lactating women, adolescents, and the aging.

Ten states, then, were selected for the National Nutrition Survey—Texas, Louisiana, Kentucky, Michigan, New York (including a separate survey of New York City), Massachusetts, Washington, California, West Virginia, and South Carolina. Both Kentucky and West Virginia were included in order to provide a composite study of the Appalachian area, as recommended by the HEW Regional Office and the Appalachia Commission.

Selection of the Sample

The sampling procedure was designed to select low-income families on the basis of their geographic location. The only data available for developing the sample on a broad national basis existed in the information collected during the 1960 census. Accordingly, the Bureau of the Census provided the Nutrition Program with lists, by state, of the enumeration districts (E.D.'s)[1] with the highest percent of families and non-family individuals who in 1960 had incomes below the Orshansky Poverty Index.[2]

Since the primary interest in each state was malnutrition among the poor, the population sampled in the Ten-State Nutrition Survey was heavily weighted toward people living in low-income areas. A random selection was made from Bureau of Census enumeration districts where the largest percentage of families were living in poverty. The universe, or sampling frame, from which the sample was drawn represented 25 percent of the state's population and the lowest income quartile based on 1960 census data. This resulted in a selection of approximately 100 enumeration districts per state, with 20 households selected from each enumeration district; due to a low response rate, this was subsequently raised to 30 households. Thus in each state the examination involved approximately one-fourth of the families in the selected enumeration districts and dietary food intake data were gathered on one-half the households and selected sub-groups of individuals.

Although the primary interest in each state was malnutrition among the poor, the universe of the Ten-State Nutrition Survey does not include

[1] Census enumeration districts are the smallest units of population (less than 500 households) for which uniform information exists across the nation, rural and urban alike.

[2] Orshansky, M.: The Shape of Poverty in 1966. *Social Security Bulletin.* March 1968.

all of this lower income group within a state, nor is it restricted to only the poor. Rather, the target population also included middle- and upper-income individuals who, because of changes in residential patterns since 1960, were living in the selected enumeration districts when the survey was conducted.[1]

Data Collection

Concurrently, five ad hoc technical committees, composed of both government and nongovernment consultants, organized a series of questions from which forms were developed for the actual recording of data. These technical working groups focused on the following aspects of the Ten-State Nutrition Survey: hematology, dietary studies, biochemical analysis, physical examinations, and epidemiology (membership of these committees is contained in Appendix II). Guidance on the dental aspect was provided by consultants from the National Division of Dental Health, NIH. Additional guidance and suggestions concerning forms and questionnaires were also received from a committee with membership from the Nutrition Committee of the American Academy of Pediatrics (which provided suggestions for studies of infants and children), the Council on Food and Nutrition of the American Medical Association, and the Food and Nutrition Board of the National Academy of Sciences. These forms were pretested in Texas and Louisiana in May 1968 (copies of the final forms are contained in Appendix III).

Rationale and Methodology

Since the Ten-State Nutrition Survey was the first comprehensive survey ever developed to assess the nutritional status of a large segment of the population of the United States, it is appropriate to review the rationale of the various components of the study, as set forth by Dr. Arnold Schaefer in his testimony before the Senate Select Committee on Nutrition and Human Needs in Washington, D. C., on January 22, 1969. The information presented in the remainder of this section (Rationale and Methodology) is adapted from Dr. Schaefer's statement to the Select Committee. This includes Table 1, which summarizes the functions and the dietary sources of the major nutrients studied during the survey.

Nutrition cannot be divorced from health. It is a part of human biology. Adequate nutrition implies the physiological utilization of essential nutrients in the amounts and in a balance that will promote optimal physical and mental function from preconception to death. *Thus, a comprehensive study of nutritional status must be so designed that it reflects the relationship between the intake and utilization of food and the total health status.*

The first indications of malnutrition are manifested by such signs and symptoms as retarded growth, lower serum and urinary excretion levels of certain nutrients, and less efficient physiological performance. Next, various clinical signs appear, for example, changes in skin, hair, and eyes. It is only after prolonged malnutrition that the advanced signs of the classical deficiency diseases become evident. Extensive research supports this thesis. *Therefore, a comprehensive and meaningful study of nutritional status must be so designed that it not only identifies overt signs and symptoms of malnutrition but also detects the early "risk" signals.*

The plan of the Ten-State Nutrition Survey incorporated the following essential basic measurements: clinical assessment including medical history, physical examination, various anthropometric measurements such as height, weight, and subcutaneous fat, and X-ray measurement of bones; biochemical measurements of the levels of various substances in blood and urine; dietary assessment of nutrient and usual patterns of food consumption; dental examinations; and such related data as socioeconomic status, food sources, and educational status. A more detailed discussion of each of these parameters follows.

Clinical Assessment. The purpose of the clinical assessment component of the Nutrition Survey was to detect physical signs and symptoms of deviation from health due to malnutrition, and included:

1. Medical History: The medical history, which was designed to obtain information in regard to disease patterns such as infections or parasitic infestations that may influence absorption and metabolism of nutrients independent of dietary intake, was useful in assessing interrelationships of nutritional status and disease.

1. Physical Examination: Physical examination helps in the evaluation of long term nutritional history. Various signs of deficiency states were assessed to determine if there was clinical evidence of nutritional deficiency. Among the most important signs and symptoms associated with malnutrition are hair quality, Bitot's spots, angular lesions of the mouth, tongue surface changes,

[1] A detailed description of the sampling methodology is contained in Appendix I.

Table 1

Nutrient	Function	Problems Associated with Deficiency	Source
Calories	Supply energy for growth and development and normal body functioning.	Inadequate caloric intake in children is evidenced by lack of growth and energy and loss of weight.	All foods. Starchy, sweet, and fat foods are concentrated sources.
Protein	Essential for normal growth and development.	A severe or prolonged deficiency in children results in retarded growth and may retard mental development. In adults, deficiency symptoms are less specific, e.g., weight loss, lassitude, and decreased resistance to disease.	Foods of animal origin, namely, meat, fish, poultry, and milk products. Cereals and beans are also an important source of protein.
Vitamin A	Essential for the formation of cells, particularly in the skin, and for normal vision; aids in maintaining resistance to infections.	Deficiency signs: Night blindness, and skin changes characterized by dry, rough skin. Prolonged Vitamin A deficiency can lead to permanent blindness. Bitot's spots are a significant finding.	Whole milk and whole-milk products; dark green, leafy, and yellow vegetables; liver.
Vitamin D	Necessary for the absorption of calcium and the normal development of bones.	Lack of Vitamin D causes rickets in children.	Vitamin-D-fortified milk. Vitamin D is formed in the skin upon exposure to sunlight.
Vitamin C	Important for normal tooth and bone formation and wound healing. Plays a role in normal resistance to infection.	Deficiency results in soft, spongy gums, prolonged wound healing, and in the advanced deficiency state, the classical disease scurvy.	Citrus fruits, tomatoes, and certain vegetables such as cabbage and potatoes.
Thiamin	Essential for growth, normal function of the nervous system, and normal metabolism.	Deficiency results in retarded growth, edema, and changes in the nervous system. Advanced deficiency can result in beriberi.	Liver, eggs, whole grain or enriched cereals and cereal products, and lean meat.
Riboflavin	Essential for utilization of protein and is also involved in other metabolic processes.	Deficiency can result in skin changes such as angular lesions, tongue changes, and poor growth.	Dairy products are the major source, but meats and green leafy vegetables are other sources.
Niacin	Essential for normal digestion and utilization of food.	The classical deficiency state is pellagra, characterized by diarrhea, dermatitis, dementia, and death.	Liver, meats, whole grain, and enriched cereals and cereal products.
Calcium	Necessary for formation of bones and teeth. Also plays a role in normal blood clotting and normal functioning of nerve tissue.	Deficiency in children may be associated with rickets; in adults, calcium may be lost from the bones.	Milk and milk products, fortified cereal products, and certain leafy vegetables.
Iron	Necessary for the formation of hemoglobin, a component of red blood cells.	Iron deficiency symptoms include weakness and fatigability. Advanced deficiency leads to anemia.	Liver, green leafy vegetables, dried fruits, enriched cereals and cereal products, molasses, and raisins.
Iodine	Essential for normal function of the thyroid gland.	Deficiency results in an enlargement of the thyroid gland, which is known as goiter.	Iodized salt is probably the most widely used source. Seafood, water, and plants from certain areas contribute substantial amounts.

thyroid enlargement, follicular hyperkeratosis and other skin changes, liver enlargement, and various skeletal abnormalities. Particular attention is given to these clinical signs in the clinical chapter of this report.

3. Anthropometric Studies: Anthropometric studies are incorporated into the clinical assessment of a nutritional survey to help to determine the effect of nutrition on physical growth and development.

4. X-ray Measurements: X-ray measurements of bones afford quantification of developmental status, regardless of body build. Bone changes are also seen in nutritional-deficiency conditions such as rickets, osteomalacia, infantile scurvy, fluorosis, and protein-calorie malnutrition.

Biochemical Measurements. Depletion of body stores of nutrients is the first step in the development of nutritional-deficiency disease. Biochemical measurements of the levels of various substances in body tissue and fluids can often present the earliest evidence of deficient nutritional status. As the deficiency progresses, functional impairment develops, and finally the physical changes characteristic of a clinically manifest deficiency disease appear. Biochemical measurements, therefore, allow an identification of populations at risk, as well as populations with frank malnutrition.

Considerable information relating biochemical measurements to dietary and clinical nutritional status was available before the Survey was begun. A set of comprehensive guidelines suitable for use in interpreting biochemical data generated by the Ten-State Nutrition Survey, although available in the *Manual for Nutrition Surveys*, required revision based on current scientific opinion. As a

starting point toward developing suitable standards, the guidelines that had been suggested by the ICNND for interpretation of biochemical data were selected and were then revised and expanded to accommodate the scope of the data to be collected specifically for infants and children through age 16. The Committee on Nutrition of the American Academy of Pediatrics assisted in developing the guidelines for infants and children. The Technical Working Group on Biochemical Analysis reviewed the guidelines and included interpretation for determination on folic acid and Vitamin B_{12}.

The comprehensive guidelines for classification and interpretation of blood and urine data collected as part of the Ten-State Nutrition Survey are shown in Appendix IV and are for laboratory data obtained by the methods referenced in Appendix V.

Dental Examination. The dental examination included an evaluation of dental health and the condition of the soft (periodontal) tissues of the mouth. While all dental findings cannot be claimed to result from inadequate nutrition, obvious relationship to dietary intake exists. For example, the presence of caries may be associated with a low intake of fluoride, and spongy bleeding gums may indicate vitamin C deficiency. Poor dental health is defined by increased rate of decayed, missing, or filled (DMF) teeth. Inability to bite and chew properly leads the individual to select soft and readily swallowed foods, which frequently are deficient in some essential nutrients, thus leading eventually to overt malnutrition. Among the aged, a major cause of inadequate dentition may be periodontal disease. Although due primarily to poor oral hygiene and inadequate dental care, it can be aggravated by nutritionally-associated caries and diseases of the gums.

Dietary Evaluation. Evaluation of dietary intake is an essential part of any complete nutrition study. Data should be obtained on the intake level and sources of nutrients, food habits, food-preparation practices, and attitudes about foods. These dietary data are essential for complete interpretation of clinical and biochemical findings, and are basic to planning dietary changes, modifying existing programs and initiating new ones that will have an influence on food habits and intake. The solution to problems uncovered by clinical and biochemical assessments depends upon a knowledge of the eating habits and the availability of food within the study area.

Other Related Factors. A variety of non-nutritional factors affect food choices and intake. A nutritional status study must include collection of data on these items—both to enable a complete assessment of possible causes underlying malnutrition, and to provide a basis for future planning. Examples of some of these related factors are:

1. Level and distribution of income.
2. Income maintenance and other social services programs.
3. Government food and nutrition programs.
4. General food availability and acceptance.
5. Health and educational facilities.
6. Socioeconomic, ethnic and cultural characteristics.
7. Overall health status and disease factors.

THE SURVEY STATES

General

The surveys within the states were made under contract arrangements worked out by DHEW Regional Office personnel and representatives of the state health departments. In seven states, the work was accomplished through contracts with the state departments of health, and

Table 2. *Contracting Organization and Dates of Survey*

State	Contracting Organization	Date of Survey
California	State Department of Public Health	July 1969—February 1970
Kentucky	State Department of Health	October 1968—June 1969
Louisiana	Tulane University, School of Medicine, New Orleans	July 1968—February 1969
Massachusetts	Health Research Institute, State Department of Public Health	January 1970—July 1970
Michigan	State Department of Public Health	February 1969—June 1969
New York State	Health Research Institute, State Department of Health	October 1968—June 1969
New York City	City Department of Health	July 1969—April 1970
South Carolina	State Board of Health	November 1969—April 1970
Texas	University of Texas Medical Branch, Galveston	June 1968—December 1968
Washington	University of Washington School of Medicine	July 1969—February 1970
West Virginia	State Department of Health	June 1969—September 1969

in three states, through contracts with university schools of medicine (Table 2). Through the contract mechanism, pertinent information was to be obtained through home interviews and clinical examinations.

Pertinent Characteristics, by State

Factors relative to each of the states at the time of selection in 1967-68 are as follows:

Texas. Texas was selected for the National Nutrition Survey for a variety of reasons. It was the state with the largest migrant population and the greatest number of persons classified as poor. Three of its cities—Dallas, Houston, and San Antonio—ranked among the top six cities of the nation with regard to the prevalence of poverty and the level of infant mortality. Despite these facts, the number of persons living in poverty who were being reached by Federal food programs at that time was less than 5 percent.

The migrant worker and his family, a group well represented in Texas, were a specific target. In Texas, also, the significant number of Spanish-Americans provided a good sample of that ethnic group.

Louisiana. In the Southeast, all of the states had a high percentage of nonwhite populations living in poverty. The infant mortality rate in the region exceeded the national average by almost 50 percent, and in a number of counties it was twice the national average.

Louisiana had an infant mortality rate 30 percent greater than the national average and ranked 44th in per-capita income. This state provided the typical poverty characteristics of populations in large cities of the Southeast. New Orleans ranked among the cities having the highest rates of poverty and infant mortality.

New York State and New York City. The poverty population included urban ghetto areas of New York City and some counties of the state. The latter included both those receiving and those not receiving food assistance through USDA food programs.

New York City ranked seventh nationally in the proportion of the population living in poverty (23.8 percent) and had an infant mortality rate higher than the national rate. Here, two large ethnic groups—Puerto Rican and black—as well as aged persons living in poverty, were available for study.

Kentucky and West Virginia (Appalachia). The Appalachian Commission and DHEW Region III staff assisted in the selection of these two states to represent the Appalachian region. Kentucky had several counties with the highest infant mortality rates in the United States. West Virginia, which was one of the ten states with the lowest per-capita income, had welfare assistance in the mid-range of $22 per recipient per month.

Michigan. Michigan had many large industrial complexes with dense populations of unskilled workers. These people concentrated in large urban ghettos, where both white and black households lived in severe poverty.

Infant mortality rates were high in these industrial centers. Detroit, for example, had an infant mortality rate approximately 10 to 20 percent above that of the entire United States; and the rates in the ghetto areas of Michigan exceeded the state average by 50 to 100 percent or more.

Thus the problems that characterized Detroit and the industrial counties of Michigan were much the same as the problems of the industrial Northeast.

California. In California, urban ghetto areas and migrant workers of Mexican-American descent represented the target groups to be included. The unique housing structure of certain areas in the state made California quite different from low-income, nonwhite areas in major cities of the Midwest and East. A sample double the size of other states was selected: approximately 4,000 families were selected, half from the northern part of the state and half from the southern part. This was based on the state's large population and the urgency for achieving maximum coverage.

Massachusetts. Selection of Massachusetts was important to the survey because of the demographic characteristics of the State. It represented the New England region, with a heavy concentration of populations of low income in communities of mixed cultural backgrounds. Selected studies and hospital reports indicated that malnutrition existed despite the concentration of medical training facilities in some areas of the state. The changing industrial development of Massachusetts, with curtailment of industries using semiskilled workers, led to a semiurban poverty group different from that in other urban industrial areas covered in the Ten-State Nutrition Survey.

Washington. Several requisite characteristics made Washington a unique state for study. Low-income white groups were present in large cities and also in rural areas, where subsistence farming, underemployment mining, and marginal fishing all contributed to an enviromnent conducive to nutritional stress.

South Carolina. The population of South Carolina was typical of the Southeastern states. A high percentage of the people were living in poverty, and the infant mortality rate in many counties was significantly higher than the national average. Mortality figures for blacks were typical of those found in many counties in the southeastern states. At the time of selection, South Carolina had a lower percentage of the poor population on welfare programs, and a number of counties were not participating in the Federal food programs.

ACTIVATING THE SURVEY PLAN

General

Once an individual state government had agreed to a survey, a meeting was held that brought together representatives of all of the agencies affected. Each state was handled individually with particular consideration of capabilities and resources. In attendance were representatives of the Nutrition Program, other Federal agencies having an interest in the survey and in food and nutrition programs, state and local agencies, and groups involved in action programs related to food and nutrition. At this meeting the general survey plan was described and the interests and resources of the Nutrition Program and other agencies were outlined.

The staff of the Nutrition Program, together with consultants from colleges, universities, and other institutions who had considerable experience in nutrition and health surveys, both within and outside of the United States, assisted in planning and carrying out the surveys. Other consultants with experience in nutrition and health epidemiological studies assisted in standardizing the laboratories and in training personnel.

Personnel and Logistics

Each state Nutrition Survey was headed by a survey director, generally a physician. Under him were two major organizational subdivisions: a headquarters unit and a field unit. The headquarters unit usually consisted of administrative and statistical personnel as well as a central laboratory. The field staff consisted of (1) an advance component of interviewer-mappers, and (2) a clinical component. The professional personnel of the survey team consisted of physicians, a dentist, dietary interviewers, laboratory technicians, and a variety of other persons specifically trained to perform anthropometric measurements, make X-rays, and provide general backup. The remainder of the team members were medical students and college students with career interests in nursing, nutrition, social work, medical statistics, and other allied health sciences. State health departments also assigned staff to work full time.

A typical survey organizational chart and a functional statement for survey personnel are presented in Appendix VI.

Responsibility for assembling equipment and for personnel, transportation, housing of the field team, and development of schedules was delegated to the survey team Administrative Officer.

Orientation and Training

Staff for field teams were recruited and were provided with approximately 2 weeks of detailed orientation. In some states, e.g., Texas, it was essential that all aspects of the field examination be conducted in Spanish as well as in English. Registration personnel and interviewers in critical areas of the survey were required to speak Spanish fluently, and all material issued to interviewers was prepared in Spanish and English.

Assisting in the training were staff from the Nutrition Program, individuals with prior nutritional survey experience from within each state, and consultants in nutrition from state agencies and medical schools.

In all states the training procedures were uniform, following methodology outlined in the *Guidelines and Procedures* developed by the Nutrition Program. Detailed training and practice sessions were held for all components, and particular attention was given to standardized training for physicians, dentists, anthropometrists, dietitians, and X-ray technicians. Standardization and training continued throughout the course of individual surveys to assure accuracy and evaluate methodology.

Mechanics of the Survey

Advance Team Coordinators. Community coordinators made arrangements for transportation of families, located facilities to be used by the field examination team, and generated local community support for the survey. Team members trained for this assignment followed the mappers into the enumeration district. They visited local governmental officials, the local medical society, and public health physicians and nurses whenever possible. Local school administrators and members of their staffs provided invaluable support. Informational letters were sent in advance to appropriate indi-

viduals and agencies in the community, requesting their endorsement and support of the survey.

Mapping. As a rule, the survey mappers arrived in the enumeration district 2 weeks in advance of the clinical team. Random selection of the 20 households was done by the mappers in the field. The area was identified and a cluster of 60 dwellings was charted. Street names and addresses were indicated, or in the absence of names and numbers, the houses were clearly described: "White with green shutters," "Unpainted with cyclone fence," or other, as appropriate. In many counties E.D.'s were located in rural areas. In some cities entire blocks of houses had disappeared since the 1960 census as land was cleared for freeways, parking lots, supermarkets, or new housing developments. Some of the homes had been abandoned and were dilapidated, with weeds growing high in the yards. Elsewhere, at the edge of small towns and cities alike, new homes indicated an influx of middle-income families into a former low-income area. Such changes were noted for the benefit of home interviewers who encountered some difficulty in persuading households that malnutrition was possible in any income group, and that participation in the survey would not label any family as "deprived" or "poverty stricken."

Permission was obtained to use public schools or other appropriate locations having the necessary working space and facilities. Requirements included running water for handwashing, nearby restroom facilities for collection of urine specimens, electrical outlets for the portable X-ray unit, for lamps, and for the vision screener, and tables and chairs as required.

Home Interviewing. The home interviewers usually arrived in an enumeration district four to five days in advance of the field examination team and visited the homes of the families selected. Each family was informed about the survey and invited to participate. In some areas, local school principals, teachers, and nurses, OEO workers, ministers, and other persons well-known and trusted in the community assisted the home interviewers. In some cases, a small remuneration was provided families for their participation in the survey.

At this time, basic household information was collected which specified the members of the household, their ages and occupations, and the level of school completed. Sociocultural data was also obtained.

The home interviewers left their completed forms at the established headquarters to serve the planning needs of the field examination team.

Field Examination Team. The completed interview forms supplied the field examination team with the information needed to plan daily participant loads, set up examination schedules, and to route the drivers who would transport families to the examination center.

Flow Through the Examination Center. Each family began the clinical examination at the registration desk, where appropriate forms were prepared. Very important at the time of registration were: (1) the recording of the name of the family doctor or clinic to provide emergency treatment if needed, and to receive copies of the results; and (2) obtaining the signature of parents or guardians giving permission for their children to be examined and tested.

A medical history was obtained from all participants. For all children up to the age of 10 or 12, information was obtained from the mother. Special medical histories were taken on all children age five and younger with emphasis on infectious diseases, immunizations, birth defects, and accidental injuries.

A clinical examination of all persons, directed toward nutritional lesions, was conducted by a physician, or by a medical student with special training and under the physician's supervision.

Following the clinical examination, the dental examination was made by U. S. Public Health Service dental consultants.

Dietary data collected on all households at the time of the clinic visit was of three basic types: (1) a 24-hour dietary recall on persons 0-36 months of age, 10-16 years of age, 60 years and older and on all pregnant and lactating subjects; (2) frequency of usage of selected foods and food groups; (3) related information such as sources of food, participation in USDA food programs, school lunch participation and food preparation facilities.

Anthropometric measurements followed or were combined with the clinical examination. These measurements included height, weight, fatfold thickness and various measurements of skeletal size.

As part of the examination process, a single posterior-anterior X-ray was taken of the hand and wrist of all subjects except the smallest children and pregnant women. A daily test film was sent for qualitative analysis, and the films followed in lots of 100 for development and processing. Interpretations of findings with regard to bone age and bone development are included in a later section of this report.

Table 3. *Examinations Performed by Population Sub-Group*

Group	Clinical		Anthropometry	Biochemical Measurement		Dental	X-Ray [3]	Dietary
	History	Examination		Hemoglobin/ Hematocrit [1]	Other [2]			
0-36 mos.	All	All	All	All	All	All	All	All
3-10 yrs.	All	All	All	All	25%	All	All	None
10-16 yrs.	All	All	All	All	All	All	All	All
17-44 yrs.	All	All	All	All	25%	All	All	None
45-59 yrs.	All	All	All	All	25%	All	All	None
Over 60 years	All	All	All	All	50%	All	All	50%
Pregnant or Lactating Female	All	All	All	All	All	All	Lactating only	All
Households	—	—	—	—	—	—	—	50%

[1] Serum iron and iron binding capacity performed on all pregnant or lactating females, children 0-36 months of age, and all individuals with hemoglobin and hematocrit values below preset limits:

	Hct	*Hb*
Males	<40	<14
Females (except pregnant or lactating)	<36	<12
Children, age 3-12	<36	<12

[2] Complete biochemical evaluation of: hemoglobin, hematocrit, serum, vitamin A and carotene, total serum protein and albumin, vitamin C, serum folate, red cell folate and urinary creatine, riboflavin, thiamine, and iodine.

[3] The intent of the survey protocol was to obtain wrist bone X-rays on all individuals except pregnant females and children under one year of age. In some states, however, not all adults were X-rayed.

Where feasible, urine specimens and blood samples were obtained from all subjects. In the field setting, analyses were made of urine for protein, blood, glucose, and ketone bodies. Hemoglobin and hematocrit determinations were performed in the field. Remaining biochemical analyses were performed in central laboratories following some preliminary separations, where required.

In the field, blood and urine for the remainder of the biochemical determinations were immediately stored under refrigeration, and later that night or early the next morning were shipped to the central laboratories. These procedures will be discussed in detail in a later section.

A summary of the examinations performed on each of the population subgorups is given in Table 3.

Data Handling. Before final analysis and interpretation of results could be started, all data were transferred either to punch cards or tapes and submitted to the Nutrition Program for analysis. The items of information collected were edited and basic tabulations prepared. Certain of the summary tables and graphics, together with preliminary interpretations were submitted to professional subcommittees of the Food and Nutrition Board, National Academy of Sciences, National Research Council, and the Committee on Nutrition, American Academy of Pediatrics for consolidated review with the Nutrition Program. These advisory reviews have formed the basis for portions of the final report of the Ten-State Nutrition Survey.

SUMMARY

The Ten-State Nutrition Survey was the first comprehensive attempt to assess the nutritional status of the American people. Never before had such a large volume of nutritional data been assembled. The survey was designed to examine the nutritional status and dietary practices of low-income groups. However, because of changes in the make-up of the Survey enumeration districts, selected on the basis of the 1960 census, data on middle- and upper-income groups were also obtained.

General demographic information was collected which describes in detail the characteristics of the sample population. Nutritional status was assessed on the basis of physical and anthropometric examinations, biochemical determinations, and dental examinations. Dietary intakes and food patterns were also evaluated. These findings are discussed in detail in the chapters that follow.

APPENDIX I

HISTORICAL DEVELOPMENT OF THE TEN-STATE NUTRITION SURVEY 1968-1970

GUIDELINES AND PROCEDURES

The Ten-State Nutrition Survey is the first comprehensive survey ever developed to assess the nutritional status of the population of the United States of America. Therefore, it is appropriate to review the rationale of the various components of the study. *Nutrition cannot be divorced from health.* Nutrition is a part of human biology. It is a cross-link between biochemistry and physiology and addresses the intact organism throughout its life span. Adequate nutrition implies the physiological utilization of essential nutrients in the amounts and balance to promote optimum physical and mental function from preconception to death. Thus, a comprehensive nutritional status study must be so designed to reflect the relationship between food intake, utilization, and the total health status. The first indication of malnutrition will be manifested by such signs and symptoms as:

1. retardation of growth
2. lower serum and urinary excretion levels of certain nutrients, and
3. less efficient physiological performance

After the early symptoms there will appear various clinical signs such as changes in skin, hair, and eyes. It is only after prolonged malnutrition that the advanced signs—such as the classical deficiency diseases—appear. Extensive research and our experience in thirty-three international surveys support this thesis. Therefore, a comprehensive and meaningful nutritional status study must be designed to detect the early "risk" signals as well as to identify overt signs and symptoms of malnutrition. The Ten-State Nutrition Survey has been planned to achieve this.

The Ten-State Nutrition Survey design incorporates:

1. Clinical assessment, including a physical history and examination, various anthropometric measurements such as height, weight, and subcutaneous fat, and bone X-ray measurements.
2. Biochemical measurements of the levels of various substances in blood and urine.
3. Dietary assessment of nutrient intake and usual patterns of consumption.
4. Dental examinations.
5. Related data such as socio-economic status, food sources, educational status, etc.

Guidelines for the Survey were developed from accepted national and international standards by the Nutrition Program Staff in cooperation with a number of professional Ad Hoc committees. These methodologies, procedures, and suggested guides published in the *Manual for Nutrition Surveys* were used as guidelines. This manual was published by the Interdepartmental Committee on Nutrition for National Defense in 1957, with a second edition being printed in 1963. This committee was composed of representatives from the (U.S.) Agency for International Development, the (U.S.) Department of State; Health, Education and Welfare, Defense, Army, Navy, Air Force, Agriculture, Interior, and the Atomic Energy Commission.

The initial activity of the survey is concerned with organizing the survey team, and training team members to complete the specific activities of the survey. Preliminary planning is necessary in order to establish acceptance of the team in local areas by official and private agencies related to health, education, and welfare, and the families selected to be in the survey sample. Information on personnel and organization are given in the section, Development of Local Support, and in the sections on technical aspects of the survey.

The activities to be completed by the survey team start after the sample has been selected. Prior to initiating the field activities, the persons responsible for each activity must become completely familiar with the procedures and the completion of the forms. Also, the entire team should have worked together, completing a pretest of a sample similar to that to be completed in the actual survey.

SCOPE OF WORK FOR THE SURVEY

1. Map the census enumeration districts selected for the study plus at least two additional for pretest purposes; separate each E.D. into segments of approximately 70 housing (no less than 60) units; select one of these segments randomly; and in this

segment select every third household for inclusion in the sample.

2. Establish initial contact with the selected household; and complete the household information questionnaire on *each* household in the sample; and obtain cooperation of the family in the clinical survey.
3. Complete the following protocol on the E.D.'s in the regular sample, using the forms and procedures provided by the government.
   (a) Complete a medical history; clinical examination, including pediatric where appropriate; anthropometric measurements; and dental examination of 100% of the sample. Complete wristbone x-ray on all subjects less than 18 years of age, all over age 35, and all other subjects from household given complete dietary questionnaires.
   (b) On one-half of the households, randomly selected, obtain the following dietary information:
      (1) General dietary census data
      (2) General food source and preparation data
      (3) Food frequency consumption data
      (4) 24-hour dietary recall data on the household
      (5) Individual 24-hour dietary recall on:
         a. All children 0 to 36 months of age.
         b. All subjects 10-16 years of age.
         c. All pregnant and/or lactating females.
   (c) On the remaining one-half of the households, obtain 24-hour recall dietary data from:
      (1) All children 0 through 36 months of age
      (2) All subjects 10-16 years of age
      (3) All pregnant and/or lactating females
      (4) All subjects 60 years of age and older
   (d) Collect blood samples from 100% of the total sample and determine hemoglobin and hematocrit levels. Collect urine samples from 100% of the total sample and qualitatively determine the presence or absence of glucose and protein.
   (e) Complete the following additional analyses on *all* individuals from 50% of the households randomly selected from those households given complete dietary questionnaires (approximately 25% of the total sample) and on *all other* individuals on whom individual 24-hour dietary recall data are obtained (sections b and c).
      Blood
      (1) serum total protein and albumin;
      (2) plasma vitamin A and carotene;
      (3) serum vitamin C;
      (4) serum and whole blood folate.
      Urine
      (1) creatinine;
      (2) thiamine;
      (3) riboflavin;
      (4) urea nitrogen;
      (5) iodine
   (f) On *all* pregnant and lactating females, *all* children 0-36 months of age and on subjects exhibiting anemia in all the other categories on whom complete biochemical evaluations are done, prepare and ship specimens to the U.S. Army Medical Research and Nutrition Laboratory (USAMRNL) for analysis of:
      (1) serum iron
      (2) serum iron binding capacity
   (g) On serum samples where only a minimal quantity is available, the samples will be sent to the USAMRNL for microanalysis of vitamins A and C.
   (h) The portion of samples (plasma, serum, and urine) remaining from the entire sample shall be stored in appropriate facilities until a decision on disposition is made by the Project Officer.
   (i) Describe the health and education resources available to each district to be surveyed; include maternal and infant clinics, health clinics, school, outpatient clinics, and similar public and private agencies.

SAMPLE DESIGN FOR HEW NUTRITION SURVEYS

Introduction

The Department of Health, Education, and Welfare is conducting the survey in several subjectively-chosen states to estimate the prevalence of nutrition-related conditions. Since primary interest is in malnutrition among the lower-income groups, the target population is restricted to those people living in specified geographic areas, where, according to the 1960 decennial census, a large proportion of the lower-income people lived. Therefore, the universe of study does not include all of this lower economic group within a state; a small proportion of the target population will be in the middle and upper income groups. The universe, or sampling frame was determined as follows:

(1) For each enumeration district (E.D.) in a state, the percent of families and single individuals which fell below the Orshansky poverty index was computed, using 1960 Decennial Census information.*

(2) The E.D.'s were sorted into three groups: E.D.'s within SMSA's (Standard Metropolitan Statistical Areas), E.D.'s in other urban areas, and E.D.'s in rural areas.

(3) Within each of the three groups, the E.D.'s were ranked by the percent of families and individuals below the poverty index, in descending order from highest percent to lowest.

(4) Then, within each group, the 1960 population of families and individuals was accumulated until 25 percent of the total in the group was reached.

(5) The target population is, therefore, the people presently living in the selected enumeration districts which accounted for approximately one-fourth of the state's population in 1960.

The survey is based on a stratified probability sample of families and unrelated individuals residing at selected addresses. To make the survey economically and administratively feasible, among other reasons, the sampling plan involves several stages of selection. For rural and small urban areas of a state the first stage of sampling is the county. Then within the chosen county, segments of about 75 (60-90) housing units within enumeration districts are selected. The last stage is a systematic sampling of addresses in the sample segments. The people living at these addresses compose the sample from small urban and rural areas. The sample for large urban areas is chosen in a similar way except that the first stage of selection consists of segments within enumeration districts.

The sample design should produce essentially self-weighted estimates since the sample is allocated to strata proportional to the total number of housing units in each stratum and the selection of sampling units is made with probability proportional to a size measure which, as in the sample allocation, is the number of housing units enumerated in the 1960 decennial Census.

Outline of Sampling Procedure

A. Rural and "Other Urban" Areas.

1. Group counties into strata and select one county from each stratum with probability proportional to the number of housing units in a county (A_{1j}). For very large, i.e., populous counties, a stratum will contain one county; for small counties, the strata will contain a number of counties.
2. Choose large counties with certainty
3. For each of the other strata, choose a random number between 1 and the accumulative total shown for the stratum. This random number identifies the county for the sample.
4. For each county chosen for the sample, including those chosen with certainty, select a sample of ED's as follows:
   (1) Determine the number of ED's desired from the county

   $$m_{1ij} = \frac{A_{1i}}{A_1} m_1$$

   where the subscript (1) refers to the Rural-"other urban" areas. A_{1i} is the number of survey units in the i^{th} stratum; A_1 is the number of survey units in the rural-"other urban" areas (i.e., $A_1 = \Sigma A_{1i}$) and $m_1 = \frac{A_1}{A} m$ where A = total number of survey units in the Universe and m is the total sample
   (2) Determine the sampling interval for the county by dividing the total number of survey units in the county by m_{1ij} or $K_{1ij} = \frac{A_{1ij}}{m_{1ij}}$.

* See "Dimensions of Poverty in 1964", page 8 for definition of the Orshansky poverty index.

(3) Select a random number R between 1 and K_{1ij}. This determines the sample ED from the first interval. Then select the remainder of the sample ED's from the County by adding the random number to the length of the sampling interval. For example, the second sample ED is identified by the number $R + K_{1ij}$. The third sample ED is identified by $R + 2\ K_{1ij}$, and so forth.

(4) For each Enumeration District selected in the sample, try to divide it into segments of about 75 survey units. These segments should then be ordered in a random fashion and the number of units accumulated within the sample ED, similar to the way that we have accumulated the ED's within a county. The specifics of how this is done should be clear from the example given below.

(5) For each segment chosen, it is absolutely necessary that its geographic boundaries be identifiable from a map and that an on-site listing be made of every housing unit within the segment.

(6) After the segments have been listed, we then select a systematic sample of housing units. First, number the housing units from 1 through the number in the segment, starting with the unit in the Northeast corner of the segment and numbering the units clockwise, following a serpentine path. After the units have been numbered, a random number between 1 and 3 and choose every third housing unit after the random start. All people in each housing unit selected will be included in the sample.

Probability of Selecting Housing Units, or Addresses in the Sample

The sample is designed so that each address or person in the universe has the same probability of selection, *if* all the segments are of equal size (which, of course, will not be true since we are not able to control the segment size that well). Otherwise the probability of selecting a person in the sample will vary from one segment to another. Since there are several independent stages of sample selection, the probability of selecting a person is the product of probabilities associated with the several stages of selection. The probability of selecting a person or an address is represented by the following expression.

$$P = \left(\frac{A_{ij}}{A_i}\right)\left(\frac{m_{ij}\text{-}A_{ijk}}{A_{ij}}\right)\left(\frac{A_{ijkl}}{A_{ijk}}\right)\left(\frac{1}{3}\right) = \frac{m_{ij}\ A_{ijkl}}{3\ A_i}$$

A_i = Total housing units in the i^{th} county group according to the 1960 Decennial Census.

A_{ij} = Total housing units in the j^{th} county in the i^{th} group according to the 1960 Decennial Census.

m_{ij} = Number of sample segments in the j^{th} county in the i^{th} county group.

A_{ijk} = Total housing units in the k^{th} enumeration district in the j^{th} county, i^{th} county group, according to the 1960 Decennial Census.

A_{ijkl} = Total housing units in the l^{th} segment of k^{th} enumeration district, according to the 1960 Decennial Census.

and 1/3 is the rate of selecting addresses that actually exist in the l^{th} sample segment at the time of the survey.

The probability reduces to

$$P = \left(\frac{m}{3\ A}\right)A_{ijkl} \qquad \text{since}$$

$$m_i = \frac{A_i}{A}\ m \qquad \text{and}$$

$m_i = m_{ij}$ since only one county is selected from a county group.

Therefore, the probability of selecting a person in the sample is a function of the total number of segments in the sample, m, the number of housing units in the sample segments according to an *a priori* allocation of housing units in the segment according to the 1960 decennial census, A_{ijkl}, the total number of housing units in the universe according to the 1960 census, A, and the sample rate applied to housing units that actually existed (i.e. occupied) at the time of the survey (one-in-three).

Illustration of Sample Procedure

1. Suppose we want a sample of 80 segments and 25 housing units per segment or total sample of 2000 survey units for the State.

   (Note: the sample to be selected is for

illustrative purposes only and should not be interpreted as the sample for a specific state).

2. There is a total of 232,318 survey units in the Universe for the state; 110,811 are in the rural-other urban group and 121,507 are in the SMSA's.

3. Thus $\frac{(110{,}811)}{(232{,}318)}(80) = 38.158$ Enumeration Districts should be allocated to the "Other Urban"—rural group of counties and 41.842 ED's to the SMSA group.

4. From the "Other Urban"—rural group, select random numbers to choose a county from each of the eleven groups or strata.

Stratum Number	Choose Random Number between	Random Number	Selected County
I	(Choose these) (with certainty)	—	Adams
II		—	Jefferson
III	1—11512	2713	Washington
IV	1—11232	7431	Monroe
V	1—15758	12001	Calhoun
VI	1—4153	0127	Jackson
VII	1—13194	6429	Polk
VIII	1—16620	14682	Lincoln
IX	1—11692	1987	Harrison
X	1—5846	5762	Tyler
XI	1—3215	2155	Madison

5. Determine the number of ED's for each county by allocating total ED's proportional to total ED's in a stratum. For Adams County, for example, the expected number of ED's is $\frac{(9504)}{(110811)}(38.158) = 3.27$; it is $\frac{(11232)}{(110811)}(38.158) = 3.87$ for Monroe. The expected number of ED's per county is as follows:

	Expected No. of ED's	*Sampling Interval**
Adams	3.27	2,906.4
Jefferson	2.78	2,906.8
Monroe	3.87	648.3
Calhoun	5.43	962.1
Washington	3.96	1,060.4
Jackson	1.43	690.9
Polk	4.54	275.8
Lincoln	5.72	423.4
Harrison (initial)	(4.03)	(556.3)
(after deleting ED # 0032)	3.03	551.8
Tyler	2.01	200.5
Madison	1.11	549.5
Total	38.15	

* See paragraph 7 below for explanation of sampling interval.

6. Determine the sampling interval for the sample counties by dividing the total survey units in the county by the expected number of ED's to be chosen from that county. For example, the sampling interval for Adams County is 9504/3.27 = 2906.4. The sampling interval for each county in the "Other Urban"-rural areas is shown above in paragraph 5.

7. There is one E.D. in Harrison County that is larger than the sampling interval; namely, E.D. #0032, which has 570 survey units. Subtract this from the total of 2242 and recompute the sampling interval. Then the new interval is $\frac{2242 - 570}{4.03\text{-}1} = \frac{1672}{3.03} = 551.8$. For this sampling scheme any E.D. which has as many or more survey units as the computed sampling interval is chosen in the sample with certainty. Its survey units must be subtracted from the total and a new sampling interval computed.

8. The selection of Sample Enumeration Districts is done as follows:

   (a) Choose a random number between 1 and the length of the sampling interval, using a table of random numbers: For Adams County, the sampling interval is 2,906.8. Thus, the random number might be 1702.1. This chooses E.D. #0043. Next add the sampling interval to the random number as follows to choose the remaining E.D.'s.

		Sample E.D. No.
Random start	1702.1	0043
add	2906.8	
	4608.9	0059
add	2906.8	
	7515.7	0034P
add	2906.8	
	10422.5	This is

   larger than the accumulated total number of survey units for the county. Thus, the sample E.D.'s consist of the 3 listed. Continue this procedure for each county until all sample E.D.'s are selected.

9. The next step is to divide the sample ED's into segments of about 75 survey units each. The number of survey units assigned to the segments must add to the number of survey

units for the ED according to the Census material. Next, order the segments randomly within the ED and accumulate the survey units in the segment as shown in the following example.

ED # 0043 was chosen from Adams County which has 240 survey units. Suppose these units can be segmented as follows:

90	housing units in segment	1
70	" " " "	2
80	" " " "	3
Total 240		

Suppose that the segments are in random order as listed above.

Accumulated total just prior to ED # 0043 1486

Accumulative total of ED # 0043

Segment 1 1576
Segment 2 1646
Segment 3 1726

The number which chose ED # 0043 was 1702.1. Consequently this same number chooses segment #3.

10. After selecting a segment we must carefully map the segment and list each housing unit within the listed segment. Number the listed housing units sequentially, starting with the unit in the Northeast corner of the segment.
11. The last step is to select a systematic sample of every third housing unit in the listed segments. The starting number should be chosen randomly between 1 and 3.

ORGANIZATION OF THE SURVEY TEAM

The survey team is made up of four components—an administrative unit, an advance team, a field clinic team, and the biochemical laboratory. The responsibilities of each group are outlined briefly below. Specific details are presented under the sections pertaining to the individual activity. Additional background information is presented at the training session. Training sessions are essential to the success of the team, since many of the individuals involved in the team have not had experience in the techniques being used in the survey, nor are they familiar with the recording forms that are used. In order to process the data, it is essential that the forms are used correctly and that the data is reported in codes that are designated for each section.

Administrative Unit

The administrative unit is responsible for all of the administrative details as assigned, such as payroll, personnel, shipping of samples, and maintaining official contact with the contract officer for the survey. The responsibility of the administrative unit to contact groups within the state must be determined by the team director and the responsible agencies in the state. This may vary from state to state, but it is essential that the responsibility for various administrative functions is carefully detailed as soon as the survey team is organized.

Advance Team

The advance team has three distinct functions —to establish contact in the areas where a sample has been identified, to carry out the mapping of the area as described in the Guidelines for the Nutrition Survey, and to complete the home interviews as directed in the Guidelines. The director of the advance team, working under the direction of the team director and with the clinical team director, must identify a suitable site for clinic activities and provide information which would be helpful to the clinic team in reaching the sample population. In order to achieve the goals of the advance team, it is essential that the interviewers and mappers be very carefully selected, with consideration given to their being acceptable to the population in the sample. The training of mappers and interviewers is one of the most important preliminary activities. The training aspect will be carried out by consultants provided by the Nutrition Program, with guidance being provided by the staff of the Nutrition Program. During the survey it is essential that the chief of the advance team evaluate the performance of the mappers and interviewers. A careful check should be kept of the participation as related to each interviewer. Information for the mappers and the home interviewers is given in sections IV & V, pages 21-54 of the Guidelines.

Field Clinic Team

The field clinic team is responsible for collecting the basic information on health status of the sample population. Training sessions are required for all individuals on the field team, including the registrar and those responsible for maintaining the correctness of the coding. Individual training sessions must be held for the physicians, dentists, field laboratory personnel, nutritionists, anthropometrists, and X-ray technicians. Prior to starting actual field work, the team should complete a test survey. The experience in the test survey should

be evaluated by the team director and discussed in detail with the entire team.

The field team director has the responsibility to work with the director of the advance team in order to make the necessary arrangements for establishing clinic sites in the areas where the sample has been selected and to make the necessary arrangements for bringing participants to the clinic. The Nutrition Program will provide guidance to the team director in relation to the procedures that have been successful in other areas. It is important to recognize that the utilization of local personnel frequently can improve the relationship of the team with the community and lead to better participation. Local problems, however, must be taken into consideration, and the team director should work with local health, education, and welfare personnel in identifying procedures which may be successful in a given area and to identify problems which must be overcome before the community will take part in the survey. The clinic director is also responsible for the handling of samples in the field, making sure that the field laboratory personnel are handling samples in an appropriate manner, and that arrangements have been made to return these samples to the base laboratory. Scheduling changes, modifications of procedures made necessary by local problems, and the handling of completed data are also the responsibility of the clinic team director.

Biochemical Laboratory

The biochemical lab is responsible for completing the necessary biochemical determinations of the samples. The laboratory director should also accept responsibility for maintaining quality control, both in the laboratory and in the field. He must call to the attention of the team director any problems in handling samples, in shipping of samples, and in the quality of the samples as received in the laboratory. The laboratory director is responsible for shipping the samples to other laboratories for special analysis and for coding of the laboratory forms. The staff of the Nutrition Program is prepared to work with the laboratory director in establishing procedures which have proven to be successful for other survey teams.

The Nutrition Program will supply the laboratory control and check samples, which must be analyzed during the course of the normal survey analysis. These results must be returned immediately to the Nutrition Program.

Specific information on the laboratory is given in Section VI B.

This general information is not intended to answer all questions concerning the organization of the teams nor the specific activities of various components of the team. This will be provided by the Nutrition Program staff through additional material and as part of the training.

SELECTION OF HOUSING UNITS

General

The following guides have been developed by the National Center for Health Statistics for use in the Ten-State Nutrition Survey to select households within the enumeration districts chosen for study.

Based upon a cruise survey of the enumeration district, it will be divided into segments of approximately 75 housing units each. A sample of 25 housing units will be obtained from the segment by selecting every third house for the survey in accordance with the methods described below.

A segment thus will be a small area of land forming part of a census enumeration district within which all housing units are to be listed and from which the housing units to be interviewed are selected.

In urban areas (cities and towns) a segment is usually a single block bounded by streets. In the open country area, the segment boundaries may be roads, creeks, rivers, railroad tracks, etc. which can be readily identified. The procedures given below discuss the methods for determining the particular sampling unit and hence the households to be interviewed in a segment assigned for canvassing.

Cruise Counts of Housing Units

The sampling for this survey will be carried out by means of modern statistical procedures. For example, every effort has been made to give each household in the universe an equal chance to be chosen for interview, as well as to select a representative sample. At the same time, consideration has been given to the efficiency of the sample design. Thus, use will be made of maps and statistics available from the Bureau of the Census for small areas such as census enumeration districts. Aerial photographs and State Highway Department maps may also be used. However, in some of the smaller towns and places, information on the distribution of housing units will not be available. In order to maintain a high level of sampling efficiency, additional information is necessary before the final selection of segments and sampling units

can be made. This information consists of rough counts of the housing units in specified areas of these smaller towns.

It will be necessary to obtain these rough counts in the segments prior to interviewing. A map will be provided showing the areas (outlined in color) for which housing unit counts are needed. These areas are to be cruised by automobile. Driving slowly along the streets in the area, count the housing units on the right-hand side of each street segment and record this count on the corresponding street segment shown on the map. A street segment is that portion of a street falling between two intersecting streets. All street segments in the area are to be covered in this manner. The resulting counts, although not 100% accurate, will provide sufficient information on the distribution of housing units within the area to enable efficient, as well as valid, selection of the sampling unit for the area.

Selection of Households to be Interviewed

1. Determination of sample households in rural areas:

For areas outside of towns and cities, maps will be prepared on which the sample segments (or small land areas) have been delineated in color. It is in these areas delineated in color that the households to be interviewed will be determined. Each segment will be assigned a different five-digit number comprised of the county and the ED number which is used to identify all the work done in the segment. For example, 03111 would mean County 031 and E.D. no. 11. The segment identification number will be shown on both the Segment Sketch Sheet and the Segment List of Housing Units for each rural segment. These forms are discussed in the paragraphs below.

For each segment proceed as follows:

a. Locate the segment beyond doubt. This is easily done since segments are usually bounded by identifiable landmarks such as streets, roads, railroad tracks, streams, rivers, power lines, etc.

b. Make a large sketch of the segment on the Segment Sketch Sheet (see Attachment), if the segment is not already sketched. There will be a sampling rate and start number recorded on each Segment Sketch Sheet. The use of these numbers in determining sample housing units will be described later.

c. Go to the northeast corner of the segment (or eastern-most point if the northeast corner is difficult to identify) and proceed around the segment in a clockwise direction, so that the housing units in the segment are on the right. Mark with a cross (X) the approximate location of all housing units *inside* the segment, including those that are vacant, on the Segment Sketch. Since some structures (e.g., a house) may contain more than one housing unit, it is important to notice such things as separate entrances, the number of mail boxes, number of TV antennae, etc. A plurality of these usually indicates more than one housing unit within the structure. Whenever a structure contains more than one housing unit, as many X's should be marked on the sketch as there are housing units. If streets or roads run into or through the segment from the boundary road, be sure to explore them and to mark the location of all housing units inside the segment. Often in the country, a dirt road may lead to a farmhouse not visible from the main road, so it is important to cover all roads running into or through the segment, as well as driving over all the roads and highways which may serve as the exterior boundaries of the segment. After marking the approximate location of all housing units inside the segment, it may be advisable to stop at a store or residence inside or adjacent to the segment and ask a local resident to check over the sketch to see if all housing units in the segment have been located.

d. Number in pencil on the sketch all housing units consecutively 1, 2, 3, etc., in a clock-wise direction, starting with the one nearest the northeast corner of the segment (or the eastern-most one if the northeast corner is difficult to identify). If there are two or more housing units in a single structure, number the lowest numbered address or apartment number first, then the remainder in ascending order of address or apartment number. If the addresses are the same and the housing units are not numbered, number from the bottom floor to the top floor, starting on the left of the first floor (the basement is considered the first floor) and proceeding around in a clock-wise, spiral direction.

e. The next step is to determine exactly which households in the segment are to be interviewed. This determination can be made by using the sampling rate and start number which appear on the Segment Sketch Sheet for the particular segment. The start number on this sheet designates the first housing unit selected for the sample. Circle in pencil this housing unit number on the sketch. The sampling rate specifies the interval between each housing unit to be interviewed, *after* the first housing unit has been selected. Thus,

given a start number of 2 and a rate of 1/3 designate as "in the sample" the second housing unit numbered on the sketch and every third one thereafter (#2, #5, #8, #11, etc.) Circle in pencil these housing unit numbers on the sketch for that particular segment.

f. There may be occasions when a housing unit is designated for interview and, in making first contact with the residents in the structure, it is learned that it contains two housing units and not one as it originally appeared. In such instances both households are "in the sample" and, hence, selected for interview.

g. A Segment List of Housing Units form (see Attached) should be prepared for each segment assigned. The information at the top of this form, except for name and date (and boundaries for rural area segments), will have already been entered at the central office. Enter the exact mailing address (e.g. Route 1, Box 49-A) of each sample housing unit on this form using the same line number (Col. 2) as was assigned to the housing unit on the Segment Sketch. The housing units on the sketch not designated for interview are also to be listed on the Segment List of Housing Units, using the line numbers corresponding to their Segment Sketch numbers. Only the highway or road number or road name need be entered in the address column for those non-sample housing units in the segment, and no other entries are to be made on the form for these units.

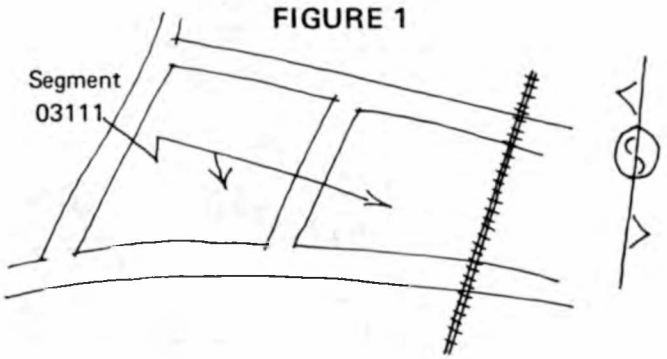
The housing units in the sample are to receive new numbers in Column 3 of the listing form, in sequence, using 1 for the first housing unit in the sample, 2 for the second, etc. The numbering of the housing units in the sample has already been entered on the listing form for each segment, but only on the first page. In many instances a second listing page and sometimes a third will be needed. An example of the Segment List form to be used for second, third, etc., pages is shown in the attached. Note that for these additional pages the proper line numbers in Column 2 must be entered as well as the page number and total number of Segment List pages in the spaces in the upper right corner of the sheet. Continue the numbering in Col. 3 of subsequent pages according to the sampling rate for the segment. The number in Column 3 is important since, together with the Segment number, it will later serve to identify the sample household.

Indicate in Column 6 of the Segment List of Housing Units whether the interview has been completed. If it has, enter a check mark. If not completed, enter "Ref." for "refused", "NA" for "Not available"; "Inf. Inc." for Informant incapable", "Other", "Moved", "NOH" for No One Home", to indicate the reason for not completing the interview.

AN EXAMPLE

Now consider a complete example and go through the several steps discussed above. Figure 1 shows a segment as it might look on a map.

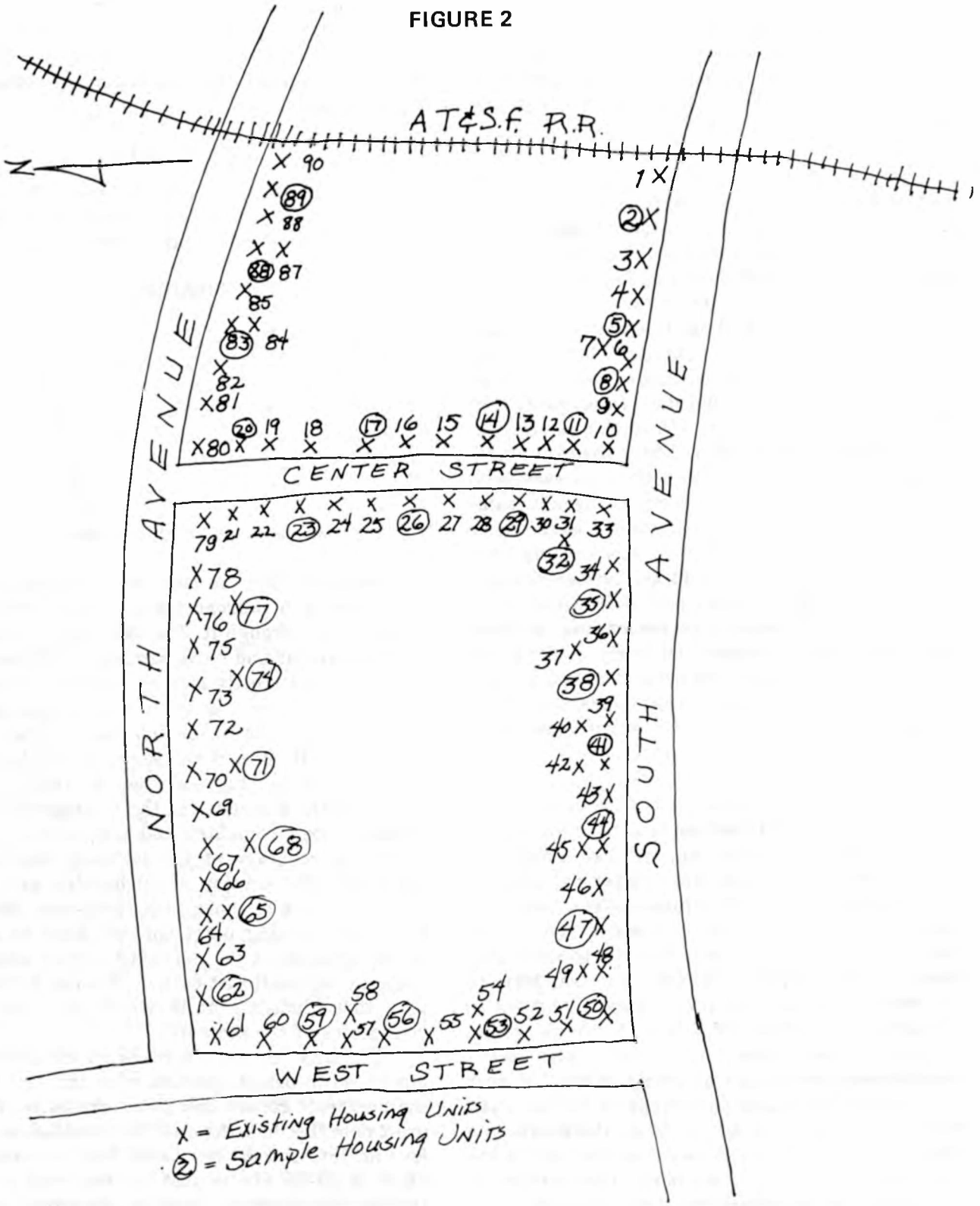
FIGURE 1



Segment 03111 is bounded on three sides by roads and by a railroad track on the fourth side. A road runs through it. The first step is to go out to this segment and drive around it sufficiently to be sure it is correctly located and identified. Stop and make *as large* a sketch of the segment as possible on the Segment Sketch Sheet. Draw it so that the north side of the segment will be at the top of the page. Proceed then to the northeast corner of the segment (at the intersection of the northern road boundary and the railroad track) and begin coverage of the segment, marking on the sketch the location of all housing units with X's. Note that to move in a clock-wise direction from this starting point one will have to go out of the segment at the northeast corner and enter again at the southeast corner. Be sure to indicate only those housing units which are inside the boundaries of the segment.

The housing units marked on the sketch are numbered in pencil, starting with the one nearest the northeast corner and going clockwise. In Figure 2 note that housing unit 10 is located on a road leading into the segment and that housing units 11-20 & 21-23 are located on the road running through the segment. Roads leading into the segment are to be covered when first encountered by turning onto them into the segment and numbering the housing units on the right as the road is followed to its end or to the edge of the segment. Then turn around and continue to number the

FIGURE 2


AT&S.F. R.R.
NORTH AVENUE
SOUTH AVENUE
CENTER STREET
WEST STREET
X = Existing Housing Units
(2) = Sample Housing Units

housing units on the right while returning to where the road entered the segment initially.

In this example assume that 90 housing units were located and numbered consecutively from 1 to 90 according to the rules, beginning in the northeast corner and moving in a clock-wise direction.

Suppose the start number at the top of the Segment Sketch Sheet is 2, then the first household to be interviewed would be #2 on the sketch, and if the sampling rate is 1 out of 3 one would interview at every third household on the sketch beginning with household #2. Thus circle on the sketch housing units #2, #5, #8, #11, #14, #17, #20, #23, and on through 90. These are the ones to be interviewed. Figure 2 shows what the sketch might look like after finishing the numbering of the housing units and selecting the sample households.

The Segment List of Housing Units would be filled out showing 90 housing units and hence using 90 lines. In column 3 of the listing form enter a 1 on line 2 (indicating sample housing unit #1), a 2 on line 5, a 3 on line 8 a 4 on line 11 and so on. If unable to interview at sample housing unit #3 (entered on line 8) on first call, but on a subsequent call found that there was a separate apartment at the rear, say, then a household questionnaire for the occupants of this apartment must be completed, as well as for the occupants of sample housing unit #3. In this case, designate the original housing unit as #3 in Column 3 but list the additional apartment at the end as #31 in Column 3. Since this housing unit would be listed on line 91, the number (91) must be shown on the Segment Sketch next to 3 which gives the approximate location of the new housing unit inside the segment.

2. Determination of sample households in places.

In places (cities or towns) the sample segments will comprise usually only one or two blocks. Do not sketch these segments. The Segment List of Housing Units will have the boundaries (i.e., street names) written in at the top of each list. The sampling rate and start number always are given at the top of the Segment List of Housing Units form. Handle these segments much in the same way as outlined previously for rural segments. Briefly, here is the proper sequence of things which must be done to determine which households are to be interviewed in a sample segment:

a. A street map with the assigned segment(s) outlined in color *or* a sketch of each assigned segment will be drawn on the Segment List of Housing Units given for use in that segment.

b. Then, using the map and the boundaries (i.e., street names) on the Segment List of Housing Units form for that segment, drive around the segment, confirming, without doubt, that one is in the proper block(s).

c. Walk in a clock-wise direction around the block and list the address and location of each housing unit *inside* the segment (including vacants) beginning at the northeast corner of the segment (or eastern-most corner if the northeast corner is difficult to determine). Handle the numbering of multi-unit structures (apartments) in the manner outlined below.

d. From the sampling rate and start number for the segment determine, in the same manner as prescribed for rural areas, which housing units are in the sample. Number these serially in Column 3. A Questionnaire is to be completed for these sample housing units numbered in Column 3 of the listing form.

Rules for Listing Multiple Dwelling Units

Case I. There is a regular numbering or lettering system.

1. Begin with the lowest number or letter and proceed numerically alphabetically to the highest number or letter.
2. If the basement units in a structure are not included in the numbering or lettering system, list the basement units before the upper floors are listed.

Case II. There is no numbering or lettering system.

1. Always list units on a lower floor before listing the units of an upper floor, beginning with the basement.
2. The unit(s) on the right are to always be listed before the unit(s) on the left. When there are two or more corridors or halls in a building, always list the corridor to the right first. Within each corridor or hall list each unit on the right of the corridor beginning at the front and working to the rear. Then list each of the units on the left going from the rear to the front.
3. In structures having units in the front and the rear, list the front unit(s) before the rear.

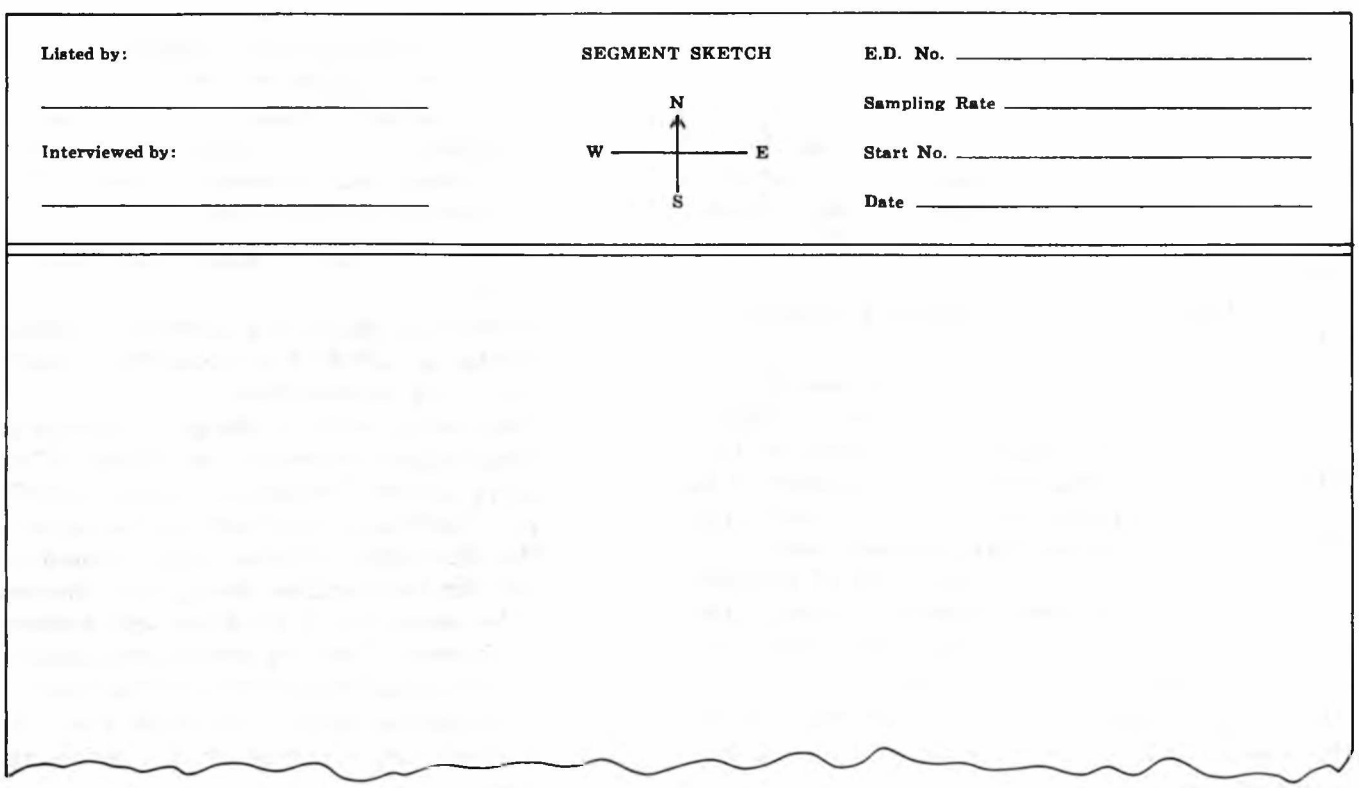
Note: If multiple addresses (an address listed more than once) are encountered on the listing sheet and the units are not properly identified either on the listing sheet or on the segment sketch apply the rules for listing to determine which is the correct unit to interview. For example, suppose a structure (address) is listed twice on the listing sheet but only the second listing is checked for interviewing. Further, suppose that upon examination both units within the structure are found to face the street. Applying the rules used for listing the left hand unit will be the unit to be interviewed.

Additional Instructions

1. Each unit is to be listed separately on the listing sheet.
2. The housing units shown on the segment sketch should always correspond to the number of units listed on the segment listing sheet. The segment sketch is most useful in identifying the housing units to be interviewed, but it can only be used when all units are properly identified.

Special Rules

1. Eligible Respondents. Any adult, 18 years of age or older, residing in a sample household is eligible for interview, providing he or she is, in the interviewer's opinion, competent to answer the questions.
2. Call-backs. If an eligible sample household member cannot be contacted on first call, make three additional attempts to find one at home in order to complete a questionnaire.
3. Substitutions. No substitutions for households designated as "in the sample" are to be made. If the survey director has decided to accept "volunteers", they are to be coded as 60, etc. in Household No. ( ).
4. Exclusions. Hospitals, institutions, military barracks and other group quarters encountered while listing the segment will not be entered on the listing sheet or on the segment sketch sheet. They thus are automatically excluded from the survey.
5. Vacation Cottages and Homes. If vacation cottages and homes (which are not considered the permanent residences of the households living in them) fall in the sample of housing units for a segment, do not complete a Questionnaire 1 on the households in them. Just fill out the first page of Questionnaire 1, indicating it is a "vacation home."



Rev.
7-29-69

TEN-STATE NUTRITION SURVEY

Interview Housing Units

Date _____ E.D. No. _____

1	2	3	4		5	6	7
ID Number	H.U. No.	Description or Street Address	Apartment No.	Apartment Loc.	Date of Interview (Non-Inter)	Reason for Non-Int	No. of Additional H.U.'s

Remarks:

Interviewer _____

SEGMENT LIST OF HOUSING UNITS

Segment Location:

Page _____ **of** _____

Segment No. _____

Boundaries

Sampling Rate _____

Start No. _____

Listing Done By:

Date _____

1	2	3	4	5		6
Street	Line No.	H.U.'s in Sample	Description or Street Address	Apartment No.	Apartment Loc.	Interviewed

Remarks:

SEGMENT LIST OF HOUSING UNITS

Segment Location: Northeast Durham, off Hwy 70 -

Boundaries Elm St. Oak St., Kent St., Maple Ave., Birch St., Ash St.

Page 1 of 2

Seg. No. 04302

Sampling Rate 1/3

Start No. 2

Listing Done By: Mary Wynn

1	2	3	4	5		6
Street	Line No.	H.U.'s in Sample	Description or Street Address	Apartment No.	Apartment Loc.	Interviewed
Block 41						
Elm	1		101			
	2	01	103	—	F	✓
	3		103	—	B	
	4		105			
	5	02	107			✓
Maple Ave	6		907	1	R	
	7		905	2	L	
Birch	8	03	104			NOH
Ash	9		900			
	10		902			
Block 43						
Elm St.			No H.U.'s			
Oak	11	04	913			✓
	12		Red brick with screened porch			
	13		905			
	14	05	903			✓
	15		901			

Remarks:

SEGMENT LIST OF HOUSING UNITS

Segment Location:

Boundaries

Page 2 **of** 2

Seg. No. 04302

Sampling Rate 1/3

Start No. 2

Listing Done By:

1	2	3	4	5		6
Street	Line No.	H.U.'s in Sample	Description or Street Address	Apartment No.	Apartment Loc.	Interviewed
Dogwood			No H.U.'s			
Maple	16		904			
Block 42						
Dogwood	17	06	201			Vacant
Oak	18		1005			
Kent	19		Green wood house with black top - blue shutters			
Maple	20	07	1002	A	R	✓
	21		1004	B	L	

Remarks:

SEGMENT SKETCH

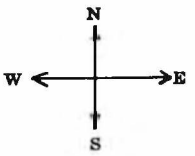
Listed by: Mary Dunn

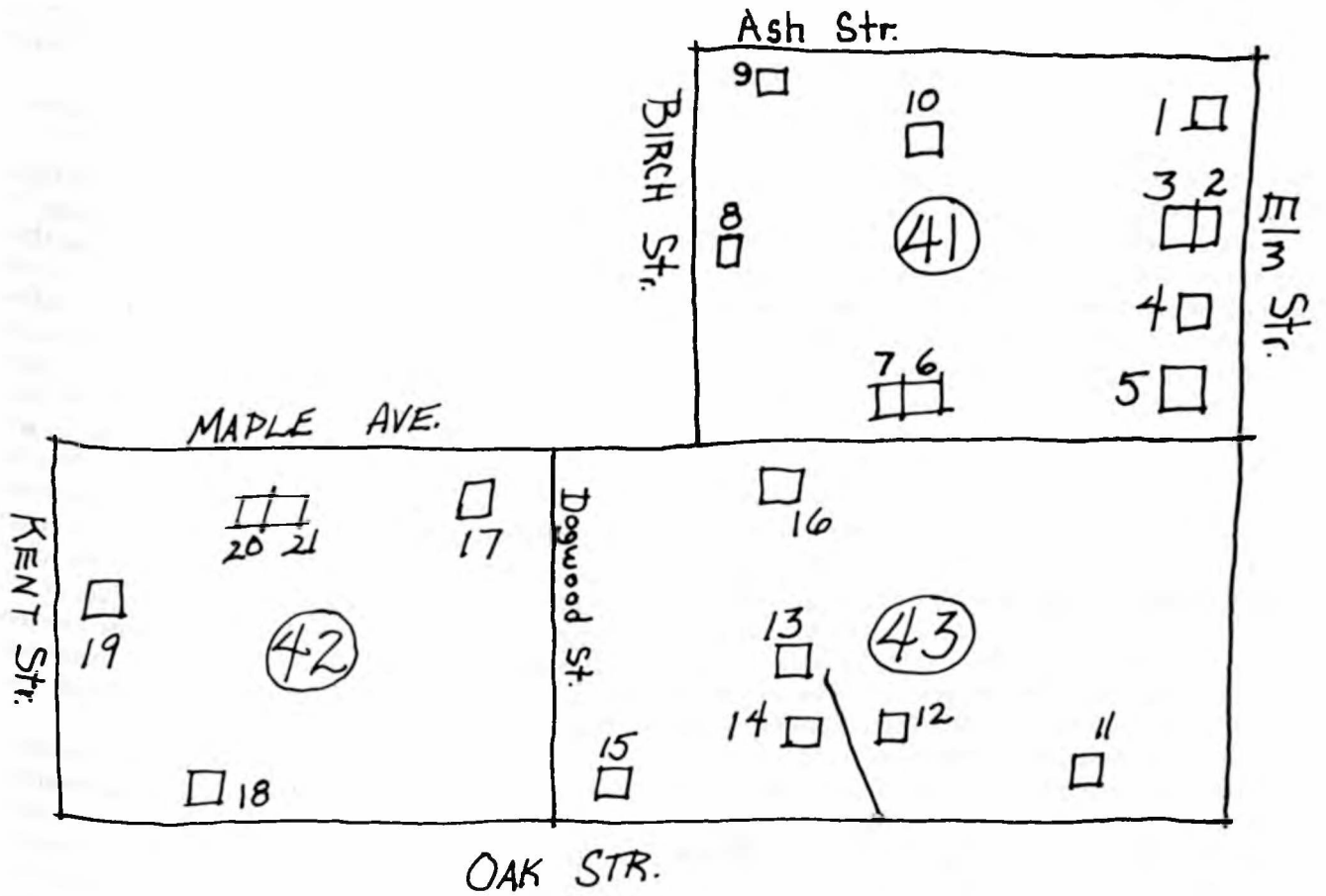
Interviewed by: Judy Bean

Segment No. 0436211

Tract 10 B

Block(s) 41 - 43





GOALS FOR THE HOME INTERVIEWERS

To insure the success of the survey by obtaining maximum response, the home interviewer must "sell" the state nutrition survey to each household, relating it to the national effort. This may be accomplished by making the benefits to the families appear not only as real ones but also as available now. An opportunity to participate in a state-wide survey ultimately improving health conditions in their own community, and the contribution to scientific knowledge are each a possible motivation for the individual respondent which the interviewer may explore. In addition, some states include token monetary inducement to each active participant in the survey. Emphasis on the need for good nutrition in relation to the growth of the respondent's children is another worthwhile approach.

It is most important for the interviewer to establish rapport with the respondent—a feeling of mutual respect and trust. The interviewer is the person who makes the first personal contact with the family and represents the survey to them. It is extremely important to recognize that the success of the survey may very well depend on the outcome of these initial communications. The respondent decides whether to participate by the appearance, by the approach, and by what is said on the part of the interviewer. The well-trained and experienced interviewer develops this good relationship more easily when he (or she) has a good understanding of the purposes, methods, and procedures to be followed in the survey.

In addition to establishing rapport and obtaining complete information on the questionnaire, the interviewer gives the respondent a choice of appointment times for the clinic. This is usually done in a way that the supervisor obtains (or is given) a block of time for his interviewers to use for appointments. The interviewer asks the respondent whether afternoon or evening would be a convenient time, emphasizing that there is no charge and that, upon request, the subject's doctor will receive the results of the examination. (It also may be helpful to state the cost—obtained locally—if the respondent were to obtain this type of examination elsewhere.) Since there is so much to be gained by complete information, each interviewer is asked to set a personal goal of 98 percent response (100 percent is improbable) and to return at least three times to each household where no one was home, or when the interview was incomplete for some reason beyond the control of the respondents. It has been found helpful to have a senior interviewer return to nonresponders to attempt to obtain response.

Obtaining Cooperation

Frequently, the manner in which a question is asked will influence the extent to which the respondent will cooperate. This requires accepting the reply without a critical or disapproving facial expression, comment, or tone of voice. This will often take some effort to accomplish, but it is imperative to do so.

Another approach that is often helpful is that of inviting or persuading the respondent to cooperate by pointing out some of the advantages of participation. For example, these statements may help to convince the respondent, "these tests (or examination) will help to tell you whether the foods you eat are giving you and your children the proper nourishment that you need," and "the information for the survey is strictly confidential and is to be used for statistical purposes only."

Some respondents may fear medical examinations or be suspicious of "government officials," or even be apprehensive of anyone coming to their door. They may not be convinced that the interviewer is what he (or she) claims to be rather than another door-to-door salesman. The skillful and tactful interviewer attempts to allay these fears by use of many techniques. A pleasant, well-modulated voice will often be reassuring, as will showing the respondent the interviewer's Survey Identification Card at the start of the interview. A prepared introduction, presented in a sincere manner, should include identification of the interviewer, purpose of call, what is expected of the respondent, and the opportunity to choose alternative appointment times for the clinic. A brief outline is the " 5 W" news reporter's guide of who, what, why, when, and where.

An extremely useful procedure in gaining confidence especially on the part of the respondent is to have a person who is well-known and well-liked in the community accompany the interviewer to each sample household. The community person usually introduces the interviewer and then tactfully leaves to preserve the confidentiality of the interview. Very often, when the respondent recognizes that the survey has the approval of community leaders and learns that her neighbors have participated, she will be more willing, if not anxious, to be included and to show up for the clinic.

A general orientation type of letter, mailed a few days in advance of the interviewer's visit, has been shown to be helpful. At the time of the inter-

view itself, a copy of the letter is given to the respondent while reference is made to the previously mailed original which was addressed to "resident" at the household address, or to the family personally when this information is available. As they recall the previous letter, they may tend to be in a more affirmative frame of mind for response to the interviewer.

In summary, a friendly, sincere, and helpful approach will be influential in obtaining good rapport and response in the important home interview.

Specific Instructions for Completion

Household Information Form (Rev. 3-69)

Purpose: This form is used to obtain detailed data on the family and relatives in each household. It provides the name, age, sex, marital status, race and ethnic group, relation to family head, education, and work experience on each person. It also furnishes basic data on the size, location, and type of housing, presence of sanitary facilities, and family income level. Since a carbon copy is made when the home interviewer records the name, age, and sex of residents, this form provides basic information for the dietary forms as well.

Completion: This form is to be completed on each household in the sample. Callbacks (at least three) are to be made in efforts to obtain a completed interview.

General Coding Instructions

Every code box should have an entry. Use the number 9 throughout the questionnaire when any item is unknown or not obtained. Use 99 for double columns, 999 for triple columns, etc. When an item is inappropriate, use 8 for "not applicable". *If a complete interview cannot be obtained, enter* T's *for those boxes with information unknown.*

Note: This form is the inside sheet (pp. 2, 3, 4,) of the double-fold form which has the words "Ten-State Nutrition Survey" on the front page.

Item	*Cols.*	*Explanation*	*Code*
A. Identification Codes			
State	1–2	Enter State code shown on attached list.	Bureau of Census code.
County	3–5	Enter County code from list available to Survey Director from Nutrition Program or Census Bureau.	Bureau of Census code.
E.D.	6–7	Each Enumeration District is coded anew for each county. (Refer to codes given to Survey Director).	Code with E.D. in sequence within each county.
Household No.	8–9	This number is obtained from the list of housing units in each segment. (Refer to explanation in "Selection of Housing Units").	01—First H.H. 02—Second H.H. etc.
Family	10	Enter code 0 if everyone in the household is related. If there are unrelated families or individuals, enter code 1 for the primary family or individual and use codes 2 through 4 for each additional unrelated family or individual. Fill out a new form for each unrelated individual or family.	0—All related 1—Primary family or individual 2—Unrelated family or individual 3—Additional unrelated family or individual

Household Information Form (cont'd).

Item	*Cols.*	*Instruction and Explanation*	*Code*
A. (Con'd)		Five or more unrelated families or unrelated individuals constitute a group and will not be included in the sample.	4—Additional unrelated family or individual
Line No.	11–12	This item is pre-coded for card No. 1 to indicate that the information collected on this card pertains to the entire family rather than to one person.	88—Household information.
Dietary code	13	This code is obtained from the nutritionists.	0—All families eat from same food preparation. 1—First family (Own separate food preparation) 2—Second family (Separate food preparation) 3—Third family (Separate food preparation) 4—Fourth family (Separate food preparation) 8—Odd-numbered households
B. Address	—	Enter the address corresponding to that on segment list of housing units.	(Not coded)
C. No. of individuals in household.			
Unrelated	21–22	Enter the total number of persons living in the household who are unrelated.	(Direct Code)
Related	23–24	Enter the total number of persons related by blood, marriage, adoption, or "common-law". These are listed in Item Q.2.	(Direct Code)
D. Type of place	25	This classifies the area as urban or rural. Rural is also subdivided into farm and non-farm.	1—Urban (2,500 pop. or more) 2—Rural farm (defined on pp. 1 of form) 3—Rural farm (defined on pp. 1 of form) 4—Rural non-farm (defined on pp. 1 of form)
E. Public sewer or water in present road	26	Emphasis is upon availability in the road or street.	Refer to code printed on form.

Household Information Form (cont'd).

Item	*Cols.*	*Instruction and Explanation*	*Code*
F. Housing unit contains piped water.	27	This provides a basis for evaluating facilities.	Refer to code printed on form.
G. Total number of rooms.	28–29	Exclude bathroom and unlived-in attic or basement.	Direct code
H. How many rooms are regularly used for sleeping?	30–31	Include only those rooms used *regularly* by members of the household only. Does *not* include guest rooms.	Direct code
I. What is usual language spoken by adults in the home?	32	Stress *usual* language. This may help to explain food pattern differences.	Refer to code printed on form.
J. How long has head of household lived within 50 miles of this place?	33–34	This gives an indication of degree of mobility.	Direct code
K. At age 16, did head live in:	35	This item indicates whether urban or rural setting at age 16?	1—Large city (over 50,000) 2—Small town or city (2,500-49,999) 3—The country (under 2,500)
L. At age 16, where did head live?	36–38	Enter the state lived in at age 16 if in U.S. If in foreign country, at age 16, enter the name of the foreign country in column 38, and 00 in columns 36–37.	Use Census Code for State. Foreign code follows: 0—None 1—Mexico 2—Canada 3—Cuba 4—Italy 5—Other European Countries 6—Central and South America 7—Asia 8—Other areas 9—Unknown (not specified)
Any children under age 12 in Head Start?	39	This item is used in those States identifying Head Start children in the sample. Use code 7 to indicate there are no children under 12 years of age. Use code 8 for States that are not identifying Head Start children in the sample. Refer to cols. 46 and 47, pp. 3 of form.	0—No 1—Yes 7—Not asked 8—Not applicable 9—Unknown

Household Information Form (cont'd).

Item	*Cols.*	*Instruction and Explanation*	*Code*
M. Respondent's line no.	73–74	This identifies the person providing the information to the home interviewer.	Obtained from page 2
N. Completion Code	75	Tells whether interview was complete and shows reason if not complete. At least three callbacks are to be made to obtain a complete interview.	Refer to code printed on form.
O. Interviewer No.	76–77	Identifies each interviewer. If more than one interviewer participates, enter the code for the one obtaining the information.	Codes assigned by Survey Director.
Card No. 1	78–80	Indicates card 1, Form I.	Precoded on form.
P. Control	—	These items are to be used by interviewer as instructed by supervisor for record of first visit and also for callback visits.	(Not coded)
		Page 2—Household Information	
Q. Family and relatives living in household		List each related person in the household. If there are any *unrelated* persons living in the household, enter them on another interview form. The identification codes (Cols. 1–10) plus the Line No. (11–12) comprise the individual identification number for all survey forms for that person. Enter names in sequence: head of household, spouse, unmarried children (oldest to youngest), grandparents, and other relatives. Enter married child and family as a group after rest of family. Include "common-law" spouse.	
1. Subject's Line No.	11–12	This identifies each person.	The line number itself is the code.
2. Last and first name of related residents.	—	Print names clearly in pencil, pressing firmly to produce a clear carbon copy.	(Not punched)
Dietary code	13	This is entered later from information supplied by the nutritionists.	0—All families eat from same food preparation. 1—First family (Separate food preparation). 2—Second family, (Sep-

Household Information Form (cont'd).

Item	*Cols.*	*Instruction and Explanation*	*Code*
Q. (Cont'd)			arate food preparation). 3—Third family (Separate food preparation). 4—Fourth family (Separate food preparation). 8—Odd-numbered household
3. Date of Birth			
Month	14–15	The date of birth is needed to determine age more precisely for children, especially. If the respondent cannot remember the date of birth, obtain the age and compute the year from present date.	01—Jan. 07—July 02—Feb. 08—Aug. 03—March 09—Sept. 04—April 10—Oct. 05—May 11—Nov. 06—June 12—Dec. 99—Unknown
Day	16–17		01–31 As given 99—Unknown
Year	18–19		Code the last two digits of year. Compute from estimated age when date of birth is not available.
4. Sex	20	Record as given. Interviewer should not probe regarding pregnancy status.	Refer to codes printed on form. Correction of information will be made after examination.
		Page 3—Household Information	
5. Marital status	39	Record as given	Refer to codes printed on form.
6. Race	40	Obtain race and ethnic group from respondent by observation only and enter the same information for each of the children of the family.	*Race* 1—Caucasian 2—American Indian 3—Negro 4—Oriental
Ethnic group	41		*Ethnic Group* 1—Spanish-American 2—Other 8—Not applicable
7. Relation to family head	42	Parents of the head of family are coded 5. Code 6 includes other relatives such as in-laws, cousins, uncles, aunts.	Refer to code printed on form.

Household Information Form (cont'd).

Item	*Cols.*	*Instruction and Explanation*	*Code*
Q. (Cont'd)			
8. Now in school	43	Consider summer vacation or holiday vacations as "now in school". Code day nursery and kindergarten as 2. Code other pre-schoolers as 0. Use 9 for unknown.	Refer to code printed on form.
9. Highest grade completed to date.	44–45	Enter latest year *completed.* For business or vocational school after high school enter 21 for one year completed, 22 for two years completed, etc. For college enter 31 for one year completed, 32 for two years completed, etc. Enter kindergarten or day nursery as "other", code 50. Include infants and other pre-school children as 88. Use 99 for unknown. Adults with no schooling are coded 00.	Refer to code printed on form.
10. Work experience last year.			
A. Person worked.	46	A "full year" consists of 40 weeks or more. Less than 40 weeks is a "part year". "Full-time" is 35 hours or more per week. Less than 35 hours is "part-time". If two or more jobs total 35 hours or more a week consider it full-time. Include military service and unpaid assistance in a family business as work. Housework in the person's own house is labor, but is not counted as work experience.	Refer to code printed on form.
If Head Start (Under 12): In what year did child first attend Head Start?	46	If the State is identifying Head Start children in the sample, use the alphabetic code in col. 46 and col. 47 for children under 12 *not* in Head Start, use code 5 in col. 46 and code 7 in col. 47. Refer to col. 39, page 1 of form.	*Head Start Codes:* A—1965 summer B—1965-66 Full year C—1966 summer D—1966-67 Full year E—1967 summer F—1967-68 Full year G—1968 summer H—1968-69 Full year I—1969 summer J—1969-70 Full year K—1970 summer
B. Major reason for not working full year, full-time.	47	Use reason given by the respondent. Persons working full-year, full-time are coded as 8 in 10.B. Use 9 for unknown.	Use code printed on form.

Household Information Form (cont'd).

Item	*Cols.*	*Instruction and Explanation*	*Code*
Q. (Cont'd)			
If Head Start (Under 12): When was the last time child attended Head Start?	47	For Head Start instructions, see above for col. 46.	For Head Start children use codes shown above.
11. Any relative who lives here now, but did not live here at least 6 months of last year.	48	Describes the composition of the household in previous year. Enter code 8—not applicable for persons who lived in household at least 6 months last year.	Use code shown on form.
Date of examination	69–74	Enter the date scheduled for clinical examination of this household.	
Month	69–70		01—Jan. 07—July 02—Feb. 08—Aug. 03—March 09—Sept. 04—April 10—Oct. 05—May 11—Nov. 06—June 12—Dec. 99—Unknown
Day	71–72		01–31
Year	73–74		69–70
Completion Code	75	This completion code is intended for recording whether the interview was completed or not, and if not completed, the reason.	Refer to code printed on form.
Interviewer No.	76–77	Identifies the interviewer	Assigned by Survey Director.
Card No. 3	78–80	Identifies form and card number for processing	Precoded on form.
		Page 4—Household Information	
R. Are there any relatives who do not live here now but did live here at least six months of last year?	22–27	Indication of composition of household in previous *calendar* year.	Refer to code printed on form. Use 0 for none in cols. 22,24,26 and 8 for not applicable, in cols. 23,25,27 when all relatives live here now.
No. of persons	22,24,26		
Reason	23,25,27		
S. Was income received last month (last year) by any	28–43	This list of sources of income helps the respondent recall the total income for the previous year. Enter these totals in Item T.4. Refer to guidelines. In-	Refer to code printed on form.

Household Information Form (cont'd).

Item	*Cols.*	*Instruction and Explanation*	*Code*
S. (Cont'd) member of the household from any of the following:		clude VA payments, RR retirement, and Social Security benefits in code 2.	
T. Can you recall about how much the total income of all persons in your family (household) put together amounted to for last month (last year)?	44–52	Although this will be an estimate, at best, it is important for evaluation. Refer to guidelines. "Last year" is defined as last *calendar* year.	Express annual income last year in hundreds of dollars and last month's income in tens of dollars. For example: Family income of $375. *last month:* (44) (45) (46) (47) 0 3 8 0 9990—Unknown For example: Family income of $4,225 last year: (48) (49) (50) (51) (52) 0 4 2 0 0 99900—Unknown
U. Do none, some or all of this family travel seasonally in search of work such as harvesting fruit or vegetables or grain crops or other seasonal labor?	53	This question refers to migrant workers.	Refer to code printed on form.
V. Is the home owned or rented?	54	First ask whether the house is owned or rented. If rented, then ask for type of rental.	Refer to code printed on form.
W. Which group would you say your family fits into most nearly of the ones shown on this card?	55–56	Show the income "flash card" to the respondent for an estimate of family annual income for the previous year. This is to be used both as confirmation of Item T. above and also as basic information for the total sample—especially for "no-shows". See Guidelines. Example of the flash card:	A—01 G—07 B—02 H—08 C—03 I—09 D—04 J—10 E—05 K—11 F—06 L—12 99—Unknown

Household Information Form (cont'd).

Item	*Cols.*	*Instruction and Explanation*	*Code*
W. (Cont'd)			
		ESTIMATED ANNUAL FAMILY INCOME A—under $1,000 G—6,000-6,999 B—1,000-1,999 H—7,000-7,999 C—2,000-2,999 I—8,000-8,999 D—3,000-3,999 J—9,000-9,999 E—4,000-4,999 K—10,000-10,999 F—5,000-5,999 L—11,000 and over	
Completion Code	75	Intended for recording whether the interview was completed or not; and, if not completed, the reason.	Refer to code printed on form.
Interviewer No.	76–77	Identifies the interviewer.	Assigned by Survey Director
Card No. 2	78–80	Identifies form and Card No. for processing.	Precoded on form.

State Codes

State	*Code*	*State*	*Code*	*State*	*Code*
Alabama	63	Maine	11	Rhode Island	15
Alaska	01	Maryland	52	South Carolina	57
Arizona	86	Massachusetts	14	South Dakota	45
Arkansas	71	Michigan	34		
		Minnesota	41	Tennessee	62
California	93	Mississippi	64	Texas	74
Colorado	84			Utah	87
Connecticut	16	Missouri	43	Vermont	13
Delaware	51	Montana	81	Virginia	54
District of Columbia	53	Nebraska	46		
		Nevada	88	Washington	91
Florida	59	New Hampshire	12	West Virginia	55
Georgia	58	New Jersey	22	Wisconsin	35
Hawaii	02	New Mexico	85	Wyoming	83
Idaho	82				
Illinois	33	New York	21	*Outlying Area Codes*	
		North Carolina	56	American Samoa	03
Indiana	32	North Dakota	44	Guam	04
Iowa	42	Ohio	31	Canal Zone	05
Kansas	47	Oklahoma	73	Puerto Rico	06
Kentucky	61			Virgin Islands	07
Louisiana	72	Oregon	92	"Other Possessions"	08
		Pennsylvania	23		

New York City — 20—Arbitrary code assigned to New York City for Nutrition Survey

State Codes

Code	*State*	*Code*	*State*	*Code*	*State*
01	Alaska	33	Illinois	61	Kentucky
02	Hawaii	34	Michigan	62	Tennessee
03	American Samoa	35	Wisconsin	63	Alabama
04	Guam			64	Mississippi
05	Canal Zone	41	Minnesota		
06	Puerto Rico	42	Iowa	71	Arkansas
07	Virgin Islands	43	Missouri	72	Louisiana
08	"Other" Possessions	44	North Dakota	73	Oklahoma
		45	South Dakota	74	Texas
11	Maine	46	Nebraska		
12	New Hampshire	47	Kansas	81	Montana
13	Vermont			82	Idaho
14	Massachusetts	51	Delaware	83	Wyoming
15	Rhode Island	52	Maryland	84	Colorado
16	Connecticut	53	District of Columbia	85	New Mexico
		54	Virginia	86	Arizona
21	New York	55	West Virginia	87	Utah
22	New Jersey	56	North Carolina	88	Nevada
23	Pennsylvania	57	South Carolina		
		58	Georgia	91	Washington
31	Ohio	59	Florida	92	Oregon
32	Indiana			93	California

20—Arbitrary code assigned to New York City for Nutrition Survey

TECHNICAL SECTION

Anthropometry

The anthropometric examination consists of: (1) a series of 10 measurements in adults and children 6 years of age and over; (2) the same measurements, plus chest and head circumference, for children under 6 years of age.

Anthropometry is carried out by two individuals. One individual makes the actual measurement; the other records the data. Each individual should alternate freely between measuring and recording.

Recommended equipment for anthropometry is given in the Appendix. Specifications including catalog numbers and a source of supply are listed. Check to make sure that catalog numbers have not been changed. In ordering spreading calipers make sure that they have proper tips. The tips should not be pointed.

A detailed consideration of the technics used in anthropometric examination is given in the accompanying table.

1. *Item:* Weight (kg in tenths)
   Instruments: Balances for adults & children
   Procedure: Subject weighed in indoor clothing, less jackets, blazers, cardigans and footwear. Males weighed without shirt and undershirt and with pockets emptied. Both balances have to be standardized daily with test weights. The reading is taken to the nearest tenth of kg.

2. *Item:* Clothing estimate
   Instrument: Balance

3. *Item:* Nude weight
   Procedure: Derived by subtracting clothing estimate from observed weight.

4. *Item:* Stature
   Instruments: Measuring board (2 m capacity) or children's measuring table (1.2m)
   Procedure: Height measurement is taken against the measuring board for all individuals able to stand over the age of two years. The individual stands with heels and back in contact with the board, without shoes, looking directly forward and his head held straight. A right angle block is slid down the board until the bottom surface touches the subject's head. The subject is told to stretch

to maximum height, leaving the heels firmly on the ground. The reading is taken to the nearest mm. Babies total height is taken on the children's measuring table up to the age of 2. The baby is kept flat on the table, legs perfectly straight against the left block and the right block is moved in to touch the baby's head. The reading is taken against the tape measure on the table. For this measurement an assistant is necessary.

5. *Item:* Knee height
Instruments: Bench (40 to 45 cm) and right angle block; for children, measuring table and spreading caliper
Procedure: A bench (40 to 45 cm high) is placed against the wall with a tape measure fixed against the wall, starting with "1" at the point where the bench ends. The subject stands shoes off at the right side of the bench with the *right foot* on the bench, the right lower leg vertical, and the left leg in a straight line with the tape. A right angle block is slid down until the bottom surface touches the patella, and then the reading is taken against the tape to the nearest 0.1 cm. For subjects with short legs, use steps or a smaller block (with tape similarly arranged) of such a height that the right knee can be properly flexed (at a right angle). For babies, the knee height is taken using the spreading caliper, from the sole at the heel to the knee with maximum pressure to compress the fat.

6. *Item:* Bicondylar diameter femur (mm)
Instrument: Sliding caliper
Procedure: Subject sits erect, shoes off, his feet resting on the ground with the right knee flexed at a right angle. Using the sliding caliper, measure the horizontal distance across the lateral surface of the *right* knee. Use maximum pressure to compress the flesh. The spreading caliper may be used with subjects having large knees.

7. *Item:* Bistyloid diameter wrist (mm)
Instrument: Sliding caliper
Procedure: Subject stands or sits with his upper *right* arm hanging, elbow bent. Using the sliding caliper with maximum pressure to compress the flesh, the distance between the radial and ulnar styloid prominences of the right wrist is measured.

8. *Item:* Biacromial diameter (mm)
Instrument: Spreading caliper
Procedure: Subject stands or sits erect, arms hanging to his side, relaxed position. Using the spreading caliper, measure the distance between the right and left acromial processes.

9. *Item:* Calf circumference (mm)
Instrument: Steel tape (cm)
Procedure: Subject *stands,* shoes off, with his feet squarely on the floor. Holding the tape in a horizontal plane, the maximum circumference of the *right* calf is taken.

10. *Item:* Arm circumference (mm)
Instrument: Steel tape (cm)
Procedure: Subject sits or stands with the *right* arm hanging relaxed. Measure midway between the right shoulder (tip of acromial process) and elbow (tip of olecranon process) and mark midpoint. (Use same midpoint for measuring arm circumference and triceps skinfold measurement. See triceps skinfold.). Measure with the tape in a horizontal plane. Shirts must be taken off or sleeves rolled up.

Skinfold Measurements

Skinfold measurements appear to be the best single, simple and practical determination of adiposity. They reflect the amount of subcutaneous fat, and are of proven value as useful measures of total adiposity.

For purposes of standardization, the accepted national recommendation for calipers is that the caliper exerts a pressure of 10 gm/mm^2 on the caliper face. The contact surface to be measured should be in the neighborhood of 20 to 40 square millimeters. These recommendations are satisfactorily met by the Lange calipers, the use of which is recommended in the interest of comparability of results. The reading of the calipers should be checked daily; small metal blocks for this purpose are available from suppliers of anthropometric tools.

The skinfold measure obtained is the doubled thickness of the pinched, folded skin plus the subcutaneous adipose tissue.

The approved method of measuring skinfolds follows. A full fold of skin and subcutaneous adipose tissue is pinched up between the thumb and forefinger of the *left* hand at a point about a centimeter along the fold (above or medial and above) from the site on which the caliper is to be placed. The fold of skin and subcutaneous adipose tissue is pulled away from the underlying muscle and held firmly during the full time the measurement is being taken.

The calipers are applied to the skinfold about a centimeter from (below or distal and below) the fingers and at the least depth of the fold at which the surfaces of the skin are approximately parallel. The distance of the measuring point from the fingers should be such that the pressure on the fold at this point is extended by the faces of the caliper and not from the fingers. Release the handle of the caliper slowly to permit the full force of the caliper arm pressure. Read the dial to the nearest millimeter. Caliper measurement should be made at least twice to obtain a stable reading. If skinfolds are extremely thick, take dial readings three seconds after application of the caliper pressure to provide for utmost accuracy.

11. *Item:* Subscapular skinfold (mm)
Instrument: Lange skinfold caliper
Procedure: The skinfold is taken just below the angle of the *right* scapula (shoulder and arm relaxed) following the natural cleavage of the skin. This is often along a line about 45° from the horizontal extending medially upward.

12. *Item:* Triceps skinfold (mm)
Instrument: Lange skinfold caliper
Procedure: The triceps skinfold is measured midway between the shoulder (tip of acromion) and the elbow (tip of olecranon) of the *right* arm, the crest of the skinfold being parallel to the long axis of the arm. It is critical that the midpoint be located because of the gradation of subcutaneous fat thickness from elbow to shoulder. The arm should be flexed at 90°; determine the midpoint by measuring with a tape and mark with a pencil. The arm of the subject should hang freely when the skinfold measurement is made. Care is necessary to avoid lifting muscle tissue with the skinfold on some subjects.

Measurements for Children Under 6 Years of Age:

1. *Item:* Chest circumference (mm)
Instrument: Steel tape (cm)
Procedure: The subject stands erect, arms at his side, relaxed position. Holding the tape in a horizontal plane at the level of the nipples, the maximum circumference is measured during normal breathing. In babies a second person should assist.

2. *Item:* Head circumference (mm)
Instrument: Steel tape (cm)
Procedure: Subject stands or sits. Measurement is taken with the tape passing just above the brow edges. Measure the maximum circumference of the head just above the ears.

Equipment for Anthropometry

1. *Balances*
   a. Detecto Physician Scale, Hand Post, capacity 140 kg x 100, Model 239
   Source: Detecto Scale, Inc.
   540 Park Avenue
   Brooklyn, N. Y. 11205
   b. Clinic Pediatric Scale, Tray 22x14x3⅜ inches, Capacity 60 kg x 20 gr, Model 1522 kg
   Source: Continental Scale Corp.
   5701 South Slaremont Ave.
   Chicago, Ill. 60636

2. *Test Weights*
   a. 1 kg, 2 kg, 5, kg, 2 x 10 kg, 2 x 25 kg
   Source: Fairbanks Morse
   5521 Navigation Blvd.
   Houston, Texas

3. *Calipers, Spreading Caliper*
   a. Capacity 30 cm wide, Cat. No. 106, Silber & Hegner, Zuerich
   Source: Silbert & Hegner Co.
   8 West 30th Street
   New York, N. Y. 10001

4. *Spreading Caliper*
   a. Capacity 60 cm wide, Cat. No. 108, Silber & Hegner, Zeurich
   Source: Silber & Hegner Co.
   8 West 30th Street
   New York, N. Y. 10001

5. *Sliding Caliper*
   a. Capacity 25 cm wide, Cat. No. 104, Silber & Hegner, Zuerich
   Source: Silber & Hegner Co.
   8 West 30th Street
   New York, N. Y. 10001

6. *Checking Gauge*
   a. 10, 20, 30, 50, 70, 100, 150, 200, 250 mm, Cat. No. 219, Silber & Hegner, Zuerich
   Source: Silber & Hegner Co.
   8 West 30th Street
   New York, N. Y. 10001

7. *Lange Skinfold Caliper*
   a. Capacity 60 mm, Cambridge Scientifics Inc.

Source: Cambridge Scientific Inc.
527 Polar Street
Cambridge, Maryland
or Silber & Hegner Co.
8 West 30th Street
New York, N. Y. 10001

8. *Baby measuring table*
   a. Custom made by carpenter, metric, Capacity 120 cm
9. *Bench*
   a. 40 to 45 cm high, custom made by carpenter
10. *Height measuring board*
   a. Capacity 2 meters, custom made by carpenter
11. *Step*
   a. 2 levels, 11 and 22 cm high, custom made by carpenter
12. *Wooden triangle*
   a. Right angle, custom made by carpenter
13. *Steel tape*
   a. 1 meter, 2 meter, Keuffel, Esser Co., Cat. No. 860356 (1 m), Cat. No. 860358 (2m)
   Source: Keufel & Esser Co.
   1701 Walker Ave.
   Houston, Texas
14. *Water Level*
   a. 5 inch pocket level, Sears Cat. No. 9G 3979
   Source: Sears, Roebuck & Co.

BIOCHEMISTRY LABORATORY EXAMINATION

General

A. *Collection of Samples for Laboratory.* Collect blood and urine samples from 100% of subjects in the survey population.
   1. Determine hematocrit and hemoglobin level of all blood samples.
   2. Qualitatively determine glucose and protein on all urine samples.

B. *Description of Sample for Complete Biochemical Evaluation.* Fifty percent of the households which undergo complete dietary evaluation will be selected at random. All members of these households will undergo complete biochemical evaluation. Thus, this subsample for biochemistry will consist of 25% of the total number of households being surveyed (50% of a 50% subsample = 25%), and should approximate 25% of the total individuals surveyed.

C. *Special Groups.* In addition to the 25% subsample described above certain special groups must undergo complete biochemical evaluations. These consist of all other individuals on whom individual 24-hour dietary recall data are obtained, as follows:
   1. all pregnant and/or lactating females.
   2. all children 0-36 months of age.
   3. all males 10-16 years of age.
   4. all females 10-16 years of age.
   5. half the people over 60 years of age.

D. *Determinations.* Complete biochemical evaluation consists of: on blood, hemoglobin, hematocrit, vitamin A and carotene, total serum protein and albumin, vitamin C, serum folate, and red cell folate; on urine, creatinine, riboflavin, thiamine, urea nitrogen, iodine, glucose (qualitative) and protein (qualitative). Methodology to be employed, and an outline for sample processing, is given below.

E. *Additional Test.* Certain subjects are to have serum iron and iron binding capacity performed, as follows:
   1. all pregnant and/or lactating females.
   2. all children 0-36 months of age.
   3. all *anemic* individuals in other categories on whom complete biochemical evaluations are done (Sections B and C). For purpose of this assessment, anemia is defined as:

	Hct	*Hb*
Men	<40	<14
Females, not pregnant or lactating	<36	<12
Children, age 3–12	<36	<12

Methodology for Biochemical Evaluation

Methods for biochemical determinations are as follows:

A. Procedures to be carried out in the participating State laboratories:
   1. *Hemoglobin* by the cyanmethemoglobin method.
   2. *Hematocrit* by the micro-method.
   3. *Total serum proteins* by the biuret method (may be automated).
   4. *Serum albumin* electrophoresis using the Beckman microzone-cellulose acetate system or automated HABA method.
   5. *Serum vitamin C* by the dinitrophenylhydrazine method.

6. *Plasma vitamin A and Carotene* by the Carr-Price method using trifluoroacetic acid chromogen.
7. *Urinary creatinine* by the picrate method. Must be automated.
8. *Urinary urea nitrogen* by the diacetyl monoxime procedure. May be automated.
9. *Urinary thiamine* by thiochrome method. Automation unacceptable.
10. *Urinary riboflavin* by modified Slater-Morrell method. Automation unacceptable.
11. *Urinary glucose* by "stix" method. Confirm positives with Benedict's test.
12. *Urinary protein* by "stix" method. Confirm positives with heat and acetic acid test.

More details and specific references for these methods are given in the *ICNND Manual for Nutrition Surveys and Auto Analyzer Methodology.*

B. Procedures to be carried out at the USAMRNL Laboratory, Denver:
1. *Plasma vitamin C* by the micro-method when limited venous blood is available.
2. *Plasma vitamin A and carotene* by the micro-method when limited venous blood is available.
3. *Serum and whole blood folates* (microbiological).
4. *Serum iron and iron binding capacity.*

C. Procedure to be carried out by contract at Boston Medical Laboratory, Inc. or other qualified laboratories.
1. *Urinary iodine.*

Quality Control Procedures for Biochemical Evaluation

Quality control procedures are to be of two broad categories: intersurvey and intrasurvey.

A. *Intersurvey Quality Control*
Intersurvey quality control (control between surveys) will be achieved through the following:
1. Use of certain biological standards from a central supply, to be furnished by the Nutrition Program:
a. vitamin A
b. carotene
c. hemoglobin
d. versatol
e. bromphenol blue
f. vitamin C
2. Insistence upon conformity in analytical methodology. (See previous section).
3. Use of stable, homogenous serum and urine pools and hemoglobin reference material distributed to participating laboratories for ascertaining laboratory to laboratory comparability. Samples of serum and urine pools and hemoglobin reference material will be distributed to all state and city laboratories conducting surveys at any one time on a regular schedule. These Ten-State Nutrition Survey Reference samples will be inserted into the samples from the field and determinations will be conducted for appropriate constituents immediately after they are received. Assays will be conducted as outlined in Methodology for Biochemical Evaluation and reported to the Nutrition Program Office.

B. *Intrasurvey Quality Control*
1. Control within a survey will be accomplished by use of stable homogenous serum and urine pools and hemoglobin reference material. Several packages of a single lot of commercially prepared lyophilized serum and urine and hemoglobin reference material will meet this requirement. The references will be analyzed several times at the start of the survey and a quality control chart will be prepared as described in the ICNND Manual for Nutrition Surveys, pp. 107-111. The references will then be divided into subsamples to be analyzed daily to insure that the laboratory is "in control." The daily subsample will be inserted into the samples from the field and assayed with the field samples with no special consideration given them.
2. Attention of the analysts and laboratory chiefs should be directed to Chapter IX of the ICNND Manual, "Suggested Interpretative Guides," especially Tables 1 to 4. Any consistent or marked deviation beyond the high and low values outlined in these tables should be regarded with suspicion by the analyst and should suggest to the analyst that he recheck either the analytical procedure or the calculations. (The absolute values given in the tables should be converted to instrument

readings for the particular instruments used by the laboratory chief so that the analyst will be able to respond immediately to any questionable results).

Outline for Processing Blood and Urine Samples

A. Blood Sampling and Processing Techniques (>1 year old)

1. Anticoagulated blood:
   One 7 ml vacutainer tube containing EDTA, B-D #4735 (old number—3202Q).
   Yield—± 5 ml blood
   ± 2.5 ml plasma
   a. Transfer 0.2 ml of whole blood for folate determination into a glass (i.e., small Pyrex disposable) tube containing 1.8 ml water-ascorbic acid solution (10.0 g of *pure* ascorbic acid *fresh* to 1 liter of water). Stopper, *mix* and freeze the diluted sample immediately and maintain frozen at all times including during shipment to USAMRNL (Denver). Glassware must be scrupulously clean.
   b. Microhematocrit (0.1 ml blood)
   c. Hemoglobin (0.04 ml blood)
   d. Centrifuge remaining whole blood.
   e. Transfer 2.0 ml plasma for carotene determination and analysis for vitamin A using the trifluoroacetic acid-chloroform chromogen.

2. Coagulated blood:
   One 20 ml or two 10 ml plain vacutainer tubes B-D #4787 (old number—3208).
   Yield—10-15 ml blood
   5-7 ml serum
   a. Remove clot and/or centrifuge.
   b. Transfer 2.5 ml serum to scrupuously clean glass tube and freeze at —20°C for shipment to USAMRNL (Denver). This must be kept frozen during shipment. Indicate on tube, e.g., by color-coded tape, whether specimen is for serum iron and iron binding capacity determination (Section E, General) in addition to serum folate determination.
   c. Aliquot 0.5 ml serum for serum protein determination and cellulose acetate electrophoresis or automated HABA.
   d. Slowly pipette 2.0 ml serum into exactly 8.0 ml of ice-cold 5% trichloroacetic acid for vitamin C determination by the dinitrophenylhydrazine method. Samples must be kept frozen in TCA during storage (—20°C), and the samples should be analyzed as soon as possible.
   e. Any remaining serum should be stored frozen locally for eventual use in a serum bank.

B. Blood Sampling and Processing Techniques (< 1 year old and limited venous blood)

1. Anticoagulated blood: (1st priority)
   One 7 ml vacutainer tube containing EDTA, B-D #4735; EDTA tubes *must* be replaced by heaprinized tubes if micro plasma vitamin C determinations are anticipated.
   Yield—±5 ml
   ±2.5 ml plasma
   a. Microhematocrit (0.1 ml blood)
   b. Hemoglobin (0.04 ml blood)
   c. Transfer 0.2 ml of whole blood for folate determination into glass (i.e., Pyrex disposable) tube containing 1.8 ml of water-ascorbic acid solution (10.0 g *pure* ascorbic acid added *fresh* to 1 liter of water). Stopper, *mix* and freeze the diluted sample immediately and maintain frozen at all times including during shipment to USAMRNL (Denver). Glassware must be scrupulously clean.
   d. Centrifuge remaining whole blood.
   e. Transfer the plasma to a 6 x 50 mm test tube. From this tube pipette 50 lambda of plasma into another 6 x 50 mm test tube; add 150 lambda of 3% metaphosphoric acid solution; mix; freeze (do not centrifuge); stopper and ship frozen to USAMRNL for determination of the vitamin C level. (If the sample of plasma is limited, then use only 25 lambda of plasma plus 75 lambda of metaphosphoric acid.)
   f. The test tube containing the remaining plasma should be stoppered, frozen and shipped frozen to USAMRNL for vitamin A determinations.

2. Coagulated blood:
   One 10 ml plain vacutainer tube.
   Yield—5-7 ml blood
   2-3 ml serum
   a. Remove clot and/or centrifuge.

b. Transfer a portion for serum total protein and albumin.

c. Transfer the remaining serum to a scrupuously clean glass tube and freeze at −20°C for shipment to USAMRNL (Denver). This must be kept frozen during shipment. Indicate on tube, e.g., by color-coded tape, whether specimen is for serum iron and iron binding capacity determination (Section E, General) in addition to serum folate determination.

CAUTIONS: Protect samples from heat and light; freeze as soon as possible; stopper well; and *carefully label all samples. Do not use plastic containers* as this may cause interference in the vitamin A determinations.

C. Procedure for Urine Samples

1. Collect a casual sample from all subjects in the survey population.
2. Use combistix to determine protein and sugar; confirm positives with Benedict's reagent and heat and acetic acid, respectively.
3. Transfer an aliquot of about 50 ml of casual urine to a brown 60 ml bottle containing enough 1.0 NHCl to adjust pH to 2-3 (4-5 ml).
4. Aliquot acidified urine as follows:

1.0 ml for urea nitrogen by diacetyl monoxime procedure (automated method)
1.0 ml for creatinine the picrate method (automated method)
10 ml for thiamine (ICNND method) (automation not acceptable)
6 ml for riboflavin (ICNND method) (automation not acceptable)
5.0 ml for iodine

Clinical Appraisal of Nutritional Status

All individuals responding to the survey will undergo a detailed clinical appraisal of nutritional status. This appraisal will be made by means of a medical history, general physical examination, anthropometry, and dental examination. Six forms are involved: Pediatric Clinical History (Children Under 6 Years of Age) (Form II); Pediatric Clinical Examination Record (Children Under 6 Years of Age) (Form III); Clinical History (Adults and Children 6 Years of Age and Over) (Form IV); General Clinical Examination (Adults and Children 6 Years of Age and Over) (Form V); Clinical Examination—Anthropometry (Form VI); Dental Examination (Form XIV.)

Specific instructions for obtaining and recording data are included on the Forms and at the end of this section. Additional comments follow:

Clinical History. This is not meant to be an exhaustive medical history leading to specific diagnoses. The intent is only to determine the presence or absence of documented significant illness which might adversely affect nutritional status. As in any medical history, questions must often be phrased in non-technical terms and in such a way that the subject understands what information is sought. The format for questioning must be flexible.

Clinical Examination. Due to the limitations imposed by survey conditions, a complete physical examination is impossible to perform. The clinical examination is intended to be a rapid survey, with primary emphasis on the presence or absence of key indicator lesions of the various nutrient deficiencies.

Definitions and Instructions for the Clinical Examination. Although some of the items are self-explanatory, others require comment or amplification, which follows. A series of color plates illustrating many of the lesions to be considered can be found in the ICNND *Manual for Nutrition Surveys.*

Hair

Dry staring: Dry wirelike, unkempt, stiff hair, often brittle, sometimes may exhibit some bleaching of the normal color.

Dyspigmentation (Pediatric form only): Definite change from normal pigment of the hair, most usually evident distally and best seen by carefully combing hair strands upward and viewing the orderly array of hair in good light. Dyspigmentation includes both change of pigment (usually lightening of color) and depigmentation. Not to be confused with dyed or tinted hair, dyspigmentation is always bandlike in character and usually is associated with some change in texture of hair in the depigmented band. In some ethnic groups, particularly Negroid groups, the pigment may be slightly reddish in color. In others, espe-

cially among straight black-haired peoples, the bandlike depigmentation ("flag sign") is common. Only rarely observed in adults.

Easily pluckable (Pediatric form only): Easily pluckable hair is that in which the shafts are readily removed with minimum tug when a few strands are grasped between the finger and thumb and gently pulled. In such cases there is a lack of reaction of the child, indicating a lack of pain associated with removing of the hair.

Abnormal texture or loss of curl (Pediatric form only): Changes in texture of the hair to a soft, silklike hair. Loss of curl self-explanatory.

Eyes

Thickened opaque bulbar conjunctivae (Adult form only): All degrees of thickening may occur. The blueness of the sclera may disappear and the bulbar conjunctivae develop a wrinkled appearance with increase in vascularity. The thickened conjunctivae may result in a glazed, porcelain-like appearance, obscuring the vascularity. Do not confuse with pterygium.

Angular lesions of eyelids (Adult form only):

Circumcorneal injection (bilateral): Increase in vascularity by new ingrowth of capillary loops, with particular concentration around the cornea in the absence of obvious infection, etc.

Conjunctival injection (bilateral): Generalized increase in the vascularity of the bulbar conjunctivae in the absence of obvious infection.

Xerosis conjunctivae: The conjunctivae, upon exposure by holding the lids open and having the subject rotate the eyes, appear dull, lusterless, and exhibit a striated or roughened surface.

Bitot's spots: Small circumscribed, grayish or yellowish-gray, dull, dry, foamy superficial lesions of the conjunctivae. Seen most often on the lateral aspect of the bulbar conjunctivae and in children. Usually bilateral. Not to be confused with pterygium.

Xerophthalmia: Xerophthalmia is recorded when the bulbar conjunctiva and cornea are dry and lusterless with a decrease in lacrimation. It is often associated with evidence of infection or, in extreme cases, keratomalacia.

Keratomalacia (Pediatric form only): Corneal softening with deformity, either localized, usually central part of lower half of cornea, or total.

Lips

Angular lesions: Record only if definitely present bilaterally when mouth is held half open. May appear as pink or moist whitish macerated angular lesions which blur the mucocutaneous junction. Angular fissures are recorded only when there is definite break in continuity of epithelium at the angles of the mouth.

Angular scars: Scars at the angles, which, if recent, may be pink; if old, may appear blanched.

Cheilosis: Different from ordinary chapping. The lips are swollen or puffy and appear as if the buccal mucosa extends out onto the lip. There may be desquamation. This category may be used to include vertical fissuring of the lips. If associated with herpes labialis, note under "Remarks."

Teeth

Visible caries 4+—For the purpose of the medical examination, caries refers to lesions readily visible. (This is in contrast to the usual definition that a tooth is considered carious when the enamel yields to underlying soft material with the explorer tip.)

Debris; Calculus; Fluorosis: See Dental Examination Guide.

Gums

Atrophy, recession, inflammation: Atrophy and recession refer to loss of substance of interdental papillae resulting in unfilled space between teeth at gingival line. Inflammation refers to typical gingivitis.

Marginal redness or swelling: Marginal redness refers to a definite red border along the dental margin of the gum. Marginal swelling refers to a swollen border of the gum which may be spongy or firm.

Swollen red papillae: Red, congested, spongy, swollen interdental papillae. Record whether localized to small area or diffuse throughout whole dental area.

Bleeding gums: Abnormal gums which either bleed spontaneously or bleed upon slight pressure with a swab stick.

Tongue

Filiform papillary atrophy: The filiform papillae are exceedingly low or absent, giving the tongue a smooth or "slick" appearance which remains after scraping slightly with an applicator stick. "Slight" involves less than one-fourth of the tongue (tip and lateral margins only); "moderate" involves one-fourth to three-fourths of the tongue; "severe" involves over three-fourths of the tongue.

Fungiform papillary hypertrophy or hyperemia: Can be seen and is felt when a tongue blade is drawn lightly over the anterior two thirds of the tongue. Hyperemia refers to definite red papillae which give the tongue a berrylike appearance. Record as moderate or severe if over 50 percent of papillae are hypertrophied or hyperemic.

Geographic tongue: Irregularly outlined and distributed areas of atrophy, with irregular white patches resembling leukoplakia.

Fissures: Linear lesions or cracks, with definite break in continuity of epithelium.

Serrations or swellings: Tooth impressions at sides of tip, often noted when tongue is swollen.

Red, scarlet, beefy (glossitis): Entire tongue is red, angry in appearance, with or without denudation or fissures. Not just a modification of the natural color due to the loss of papillae. Associated almost always with subjective symptoms of hypersensitivity, burning, even taste changes.

Magenta colored: The color of alkaline phenolphthalein.

Face and Neck

Malar pigmentation (Adult form only): Areas of darkened, brown pigmentation over the malar eminences.

Nasolabial seborrhea: A definite greasy yellowish scaling or filform excrescences in the nasolabial area which become more pronounced on slight scratching with the fingernail or a tongue blade.

Parotids visibly enlarged: Due to difficulties in assessing parotid enlargement, record as positive only if clearly visible and bilateral enlargement present.

Thyroid enlarged: The World Health Organization (WHO) criteria used for grading goiter are:

Grade O: Persons without goiter. By definition these are persons whose thyroid glands are less than 4 to 5 times enlarged.

Grade I: Persons with palpable goiters. The thyroid is considered to be more than 4 to 5 times enlarged although not visible with head in normal position. Most of these will be readily visible with the head thrown back and the neck fully extended.

Grade II: Persons with visible goiters. Persons with goiters which are easily visible with the head in normal position but which are smaller than those in Grade III. Palpation may be helpful in determining the mass of the gland, but is not needed for diagnosis.

Grade III: Persons with very large goiters. The goiters of persons in this category can be recognized at a considerable distance. They are grossly disfiguring and may be of such size as to cause mechanical difficulties with respiration and in the wearing of clothes. (Perez, C., Scrimshaw, N. S., and Munoz, J. A., Technique of endemic goitre surveys. In Endemic Goitre; p. 369, see esp. p. 376, World Health Organization Monograph Series No. 44, Geneva, 1960.)

Fingernails

Clubbing refers to an increase in the angle at the base of the fingernail. *Spooning* indicates concavity of the outer surface of the nail. *Ridging* refers to the presence of multiple longitudinal ridges in the nail. The last two signs are seen in some cases of chronic iron deficiency anemia.

Skin

Follicular hyperkeratosis: This lesion has been likened to "gooseflesh" which is seen on chilling, but it is not generalized and does not disappear with brisk rubbing of the skin. Readily felt, as it presents a "nutmeg grater" feel. Follicular hyperkeratosis is more readily detected by the sense of touch than by the eye. The skin is rough, with papillae formed by keratotic plugs which project from the hair follicles. The surrounding skin is dry and lacks the usual amount of moisture or oiliness. Differentiation from adolescent folliculosis can usually be made through recognition of the normal skin between the follicles in the adolescent disorder. It is distinguished from perifolliculosis by the ring of capillary congestion which occurs about each follicle in scorbutic perifolliculosis.

Dry or scaling skin (xerosis): Xerosis is a clinical term used to describe a dry and crinkled skin which is accentuated by pushing the skin parallel to its surface. In more pronounced cases it is often mottled and pigmented, and may appear as scaly or alligatorlike pseudoplaques, usually not greater than 0.5 cm in diameter. Nutritional significance is not established. Differential diagnosis must be made from changes due to dirt and exposure and ichthyosis.

Hyperpigmentation: Asymptomatic, with no inflammatory component. It is seen most frequently on the dorsum of the hands and lower forearms, particularly where skin hygiene is poor.

The skin is rough, dry, and often has a grayish cyanotic base. There is not a sharp line of demarcation at the border of the lesion such as one sees in pellagra.

Thickened pressure points (other than elbows and knees): Look especially at belt area, ischial tuberosities, sacrum and over greater trochanters. Other sites may occur as a result of a given occupation. Do not record when found only on elbows and knees.

Perifolliculosis (Adult form only): Congestion around the follicles which does not blanch upon pressure. (See discussion of follicular hyperkeratosis above.) Early ring of capillary engorgement around some hair follicles which does not disappear on pressure. It is more frequently encountered on the dependent parts such as the legs. Swelling and hypertrophy of the follicles may occur, at which time the skin becomes rough. Follicular hyperkeratosis and perifolliculosis may coexist.

Purpura or petechiae (Adult form only): Small localized extravasations of blood, red or purplish in color, depending on time elapsed since formation. Usually distributed at sites of pressure, and may be perifollicular.

Crackled skin (Adult form only): Definite scales larger in size than those seen in xerosis. It is often congenital and is most prominent in cool weather. It is non-nutritional in origin.

Pellagrous dermatitis (Adult form only): Record when symmetrical lesions typical of acute or chronic, mild or severe pellagra are observed. Record location.

Abdomen

Potbelly (Pediatric form only): Record if abdomen appears abnormally distended and enlarged, with due recognition of the usual contour of the young child.

Hepatomegaly: Record liver edges more than 2 cm below the costal margin.

Lower Extremities

Pretibial edema: Record only if bilateral.

Calf tenderness (Adult form only): Record when definite bilateral evidence of painful sensation occurs upon squeezing the calf muscles firmly between the thumb and finger. Record only if moderate or severe.

Absent knee/ankle jerk (Adult form only): Record only if absent bilaterally with reinforcement.

Absent vibratory sense (Adult form only): Test with tuning fork at 128 vibrations per minute over the lateral malleoli. Record as positive only if absent bilaterally.

Scrotum

Scrotal dermatitis (Adult form only): The scrotum usually must be rotated to see the lesions. Differentiate from fungus infections which usually extend onto the skin of the groin adjacent to the scrotum.

Pulse Rate and Blood

Pulse rate (Adult form only): Count for a minimum of 30 seconds.

Blood pressure (Adult form only): Take on right arm, with individual in sitting position. Make reading upon disappearance of sound. Record data to nearest even unit.

Skeletal (Pediatric form only)

Beading of ribs: Record when there is definitely palpable and visible enlargement of the costochondral junctions.

Bossing of skull: Record when there is abnormal prominence or protrusion of frontal or parietal areas.

Dietary Studies

Dietary studies constitute an essential part of any complete nutrition survey, providing essential information on nutrient intake levels, sources of nutrients, food habits, and preparation practices and attitudes. Under conditions where clinical observations are insensitive for detecting basic nutritional problems, nutrient intake studies are essential. Nutrient intake data offer direct means of estimating dietary levels for several nutrients for which routine laboratory or clinical tests have not yet been developed. The solution of problems thus uncovered depends upon knowledge of eating habits and the availability of food in conjunction with a sound program of food technology.

Although both clinical examinations and biochemical tests provide direct means of studying the nutritional status of the individual, the basic information collected in dietary studies is necessary for planning desirable changes in nutritional practices. Dietary studies give information which is needed for modifying existing economic, agricultural, and food management policy programs.

For these reasons, dietary studies include the collection of information concerning food habits

and customs, food supply and seasonal variations, food procurement and distribution, methods of food preservation and preparation procedures. Information is collected on infant and child feeding, school and institutional feeding practices, economy of food use, unique nutrient contributions of special food items and nutrient content of unusual foods of significance. In addition, the amount of specific foods ordinarily consumed, is also obtained.

DIETARY COMPONENT

The dietary component of this survey is designed to provide a description of food consumption by the total household and of selected sub-samples. Since the overall objective is to describe the nutritional status of "groups" as contrasted to "individuals," it was decided that a 24-hour recall would provide as reliable data as a record of longer duration. The recall data with the additional frequency and general information will make it possible to estimate nutrient intake and provide an indication of the nutritional quality of the diets consumed. These data will also assist in the interpretation of the clinical and biochemical results and be of value for planning subsequent follow-up programs.

Details relative to securing data, recording, processing and interviewing appear in the guidelines that follow:

The common protocol provides for the population to be divided into the following sub-samples and data collected as indicated:

1) One-half of households (approximately 1000) (First Half)

	Ten-State Nutrition Survey
a) General identifying data.	Form No. VIII
b) General purchasing and preparation data.	Form No. VIII A
c) 24-hour recall of everything consumed by the total household from the home preparation source (not to be allocated by individuals).	Form No. VIII B
d) Frequency of intake of selected food groups by household.	Form No. XI

2) Remaining one-half of households (approximately 1000) (Second Half)

a) 24-hour recall of everything consumed the previous day by any male or female 60 years of age or older.	Form No. IX

3) The following will be collected from all households:

a) Pregnant and/or lactating females 24-hour recall	Form X
b) Males (10-16) and females (10-16) 24-hour recall	Form XII
c) Children 0-36 mos. 24-hour recall	Form XIII

General descriptive data of the community basic to planning follow-up programs will be collected on a geographical basis. Information should describe such things as:

a) Food availability
b) Welfare programs in operation
c) School health programs
d) School feeding programs
e) Food prices on staple items
f) Health facilities
g) Institutional care facilities
h) Educational facilities

Dietary forms with specific guidelines are attached. A suggested guide for collecting the general community information is also included.

Personnel

The personnel requirements for conducting the dietary phase of the nutrition survey will vary with the time schedule and place of data collection. Additional time will be required if dietary data is collected within the home setting and may necessitate more personnel.

1) Each survey should have a designated

Dietary Director with experience in field survey procedures. Training in nutrition and/or dietetics plus ability and experience in training and supervising dietary interviews is necessary.

2) Assisting the Dietary Director will be the dietary interviewers. If possible, the number should be restricted to 10-15 for standardizing techniques and more efficient collection procedures. It is desirable to have the same interviewers throughout the survey. Experience in interviewing and an understanding of nutrition and local food patterns is desirable. Dietitians, nutritionists, and home economists constitute a desirable manpower source. In selected instances and with appropriate training and supervision students and public health nurses may be effective interviewers. The use of lay persons as interviewers is discouraged.

The following averages of time required for the dietary interviews can be used to estimate the number of personnel required.

a) For completing the Dietary Forms on Households, including one sub-sample (either an infant 0-36 months or a pregnant respondent) averages 45-60 minutes.

b) All individual 24-hour recalls range between 15-30 minutes depending upon respondent's ability to answer questions.

Equipment

Dietary Record Forms, pencils, paper pads, ballpoint pens, manila folders or envelopes for records.

Clipboard for each interviewer plus three extra
Individual pencil sharpeners
U.S. Department of Agriculture Handbook No. 8, 1963
U.S. Department of Agriculture House and Garden Bulletin No. 72
One copy Master Dietant Table
Lists of Foods in Dietant Table (copy for each interviewer)
Graduated, Standardized portion size models (one set per interviewer)
Guidelines for Dietary Data Collection (one set per interviewer)
One copy of Standard Recipe Book to assist in arriving at portion sizes.

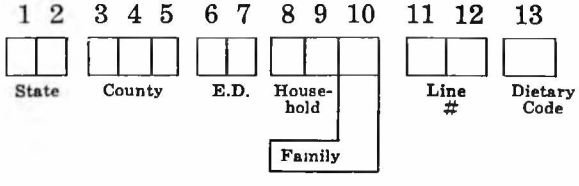
General Guidelines

It is important for each Dietary Director and dietary interviewer to understand the system of identification and the necessity for each person to retain the same code throughout each component of the survey.

For general purposes—including the enumerator's first contact in the home when the Household Information Form is completed, and for the clinical, dental, and biochemical data, persons who live under a "common roof" are classified according to whether they are "related" or "non-related."

For dietary purposes, persons are classified according to whether they eat from a "common food preparation source" without regard for relationship.

Assignment of Identification Code: At the time of the initial interview, the enumerator will complete Household Information Form which is attached to Dietary Form No. VIII as an insert. According to preassigned numbers, the enumerator will complete the first 10 columns of the Identification Code as follows:



Columns 1-7 are completed according to preassigned numbers given the enumerators. Columns 8-10 identify the individual household. *Column 10 will always be zero (0) unless there are unrelated persons dwelling under the same roof.* In that case column 10 would be used to denote the first (or primary family) and a "1" inserted. A separate Household Form would be completed on the unrelated individual or family and a "2" placed in column 10. Should a third unrelated family or individual live within this same dwelling, then another Household Form would be completed and a "3" placed in column 10.

If multiple *related* families reside in the same dwelling unit, column 10 is completed with a zero (0) and the enumerator will list all persons on the same household form.

Since it is very possible that unrelated persons may eat from the same food preparation, or even that two related families considered by the enumerator to be a single household (or family) may prepare meals separately, it is necessary to assign a "Dietary Code." Column 13 will be used for this.

The following situations may be encountered and since the enumerator *will not* inquire about meals, the dietary interviewers *must assign the dietary code.* (For illustrative purposes, we will assume this is household number 10, and show each possible situation as it would be coded).

Possible Household Occupants	*Coded by Enumerator* (Columns) (8)	(9)	(10)		*Dietary Code* (Column 13)
1. Single Family (one food preparation).	1	0	0		0
2. Two or more related families: (eat from same food preparation).	1	0	0		0
3. Two or more related families: (separate food preparation).	1	0	0		1 (1st family) 2 (2nd family etc.)
4. Two or more unrelated families: (same food preparation).	1	0	1	(1st family)	0
	1	0	2	(2nd family)	0
5. Two or more unrelated families: (separate food preparation).	1	0	1	(1st family)	1 (1st family)
	1	0	2	(2nd family)	2 (2nd family etc.)

For purposes of collecting dietary data, the following system will be used:

1) *Any* household with *zero* or an *even* number in column 9 will be assigned to the "first half" of the households; dietary data will be collected on this group if the dietary code is "zero" or "1". Any individual or group (family) whose dietary code is "2" or above will not be included for dietary data regardless of code number.
2) In the event that the household has more than one sub-sample (0-36 months or pregnant/lactating), this order of priority will be followed *if time does not permit collecting data on each individual.*

1st Infant 0-36 months
2nd Pregnant/lactating
3rd Second infant

Where more than one infant is in the 0-36 months age group, the following method of selection will be used: if column *9* is either *0*, *2*, or *4*, take the youngest infant; if column *9* is a *6* or *8*, take the older.

Dietary Form No. VIII

Household Roster

Purpose: To describe the individuals that constitute the household with reference to age, sex status, meal pattern and special dietary prescriptions.

Completion: To be completed on each household in the first-one-half of households. Refer to general instructions for identification code. (These will be households with an even number in column 9 and with a zero or "1" in column 13.)

Respondent: Will, in general, be the homemaker for the household. Information sought will necessitate that informant know entire household, habits, etc.

Note: The dietary interviewer will previously have received this Household Information Form from the enumerator.

Once the Dietary Interviewer determines from the respondent whether this is a *single* or *multiple household for dietary purposes,* names and line item numbers should be verified and dietary code assigned to each individual. If additional persons (related or non-related)

consumed one or more family-defined meals from that source yesterday, draw a heavy line and list them by name, completing all other information to degree possible.

DO NOT skip any *line* between 1-17.

Column Number	*Item and Explanation*	*Code*
1–10	*Identification Data*—will be completed by household interviewer.	
11–12	Precoded. On all other forms, if a household form, column is precoded 88. If an individual form, copy subject's line number from Form VIII.	01
13	*Dietary Code.* Record dietary code as assigned according to General Guidelines. In the event two or more related individuals or families reside in the same dwelling but do not prepare food together, the dietary codes assigned to the first family members would be 1. The code for the second family's members would be 2. However, in the identification section A, record 1.	0,1,2,–
14–15	*Respondents Line Number* Record respondent's line number appearing in column 11–12.	01–16
16–21	*Date of Examination* Record the actual month, day and year of the *interview.*	Month: 01–12 Day: 01–31 Year: 69,70,etc.
11–12	*NAMES.* Verify last name and first name of all persons listed by enumerator. If other individuals consumed one or more "family defined" meals from household source yesterday, draw line, and record names, complete *all* information on those Subjects also. DO NOT skip any lines in the roster.	—
13	Dietary Code. Refer to general instructions.	0,1,2,3,4,5.
22–27	*Date of Birth* Record on all members of the household as well as on any guests. If unknown secure approximate age and compute.	Month: 01–12 Day: 01–31 Year: last two digits 99 Unknown
28	*Sex and Pregnancy Status* Record for each individual.	1—Male 2—Female 3—1°Pregnant 4—2°Pregnant 5—Lactating 6—1°Lactating and Pregnant 7—2°Lactating and Pregnant

Column Number	*Item and Explanation*	*Code*
33–36	*Meals Eaten Yesterday* Complete for each individual. This data forms the basis for determining nutrient requirements and adequacy of intake. Packed lunches eaten away from home are considered home source.	0—Ate from home source 1—Ate from other source 2—Did not eat 3—Does not know
37	*Usual Home Meal Pattern* Complete for each individual. Source is not important. The purpose is to determine the pattern of intake.	0—None 1—All meals 2—Only a.m. 3—Only noon 4—Only evening 5—a.m. and noon 6—a.m. and evening 7—Noon and evening
38	*Special Diet* Complete for each individual who is currently on a special diet. Persons who may be on a diet, but temporarily not following it, are considered "to be on a diet."	0—None 1—Diabetes 2—Caloric restriction 3—Na restriction, for pregnancy 4—Na restriction, other 5—Other
39	*Special Diet—Doctor Prescription* Persons who have been placed on a special diet at a clinic where a nurse may be following doctor's orders should be coded "2".	1—No 2—Yes 8—Not applicable
40	*Anthropometry* Record unit of measurement used for weight. This is to be copied from Form VI.	1—Kgs. 2—Lbs.
41–44	*Anthropometry* Copy directly from Form VI.	Actual numbers
45–48	*Anthropometry* Copy directly from Form VI.	Actual numbers
49	*Height and Weight Reliability* Record appropriate code regarding reliability.	1—Both actual 2—Weight estimated 3—Height estimated 4—Both estimated
75	*Completion Code* Code as appropriate.	0—Completed 1—Refusal 2—Not available 3—Informant incapable 4—Other
76–77	*Interviewers Name and Number* Record preassigned number.	Actual number
78–80	*Card Numbers* For tabulation only.	Precoded

Dietary Form No. VIII A

Household General Information

Purpose: To describe the household's food sources, facilities for preparation, and ascertain some idea of the amount of income available for food. These data will be particularly helpful in planning follow-up programs. For example, one cannot relate the presence or absence of certain cooking facilities to nutrition, but such information would be needed in planning education programs aimed toward better food preparation practices.

Completion: To be completed on each household in the first one-half of households.

Respondent: Will, in general, be the same respondent as for Form No. 1—the homemaker.

Column Number Card No. 1	*Item and Explanation*	*Code*
1–21	*Identification data* Complete according to instructions for Dietary Form No. VIII.	
22–27	*Source of food supply* Six sources of food are listed. Record 1 if applicable as a usual source of food for the family and 0 if it is not. More than one source may be used. If so, record 1 for each source.	1—Applicable 2—Not applicable
28–51	*Home produced food* For each of the eight food items (a-h) record the actual amount the family consumed. If none was produced record 0000 or 00 as number of columns permit.	Numbers indicating actual amount 0000 or 00–if non-produced
52–55	*Places of food purchase & methods of payment* "Supermarket" is a store with three or more checkout clerks. "Farmstore" is a company type store or commissary (not military). "Neighborhood store" is a small store with less than three checkout clerks, a delicatessen, carry-out, etc. "Other" is any local variations including non-profit cooperatives, home-delivered dairy products, etc. For each of these types of establishments, record the code which is applicable for the method of payment used.	1—No or only occasionally 2—Cash 3—Credit 4—Cash & Credit
56	*Food programs available in area* The interviewer should record what food programs are available in the particular area.	0—None 1—Stamps 2—Commodities 3—Both
57	*Surplus foods (donated commodities)* Record the appropriate code indicating whether the family is currently getting surplus foods.	1—No 2—Regularly 3—Occasionally 8—Not applicable

Column Number	*Item and Explanation*	*Code*
58	Record the appropriate code indicating whether the family ever got surplus foods.	1—No 2—Yes 8—Not applicable
59	*Food stamps* Record the appropriate code indicating whether the family is *now* purchasing food stamps.	1—No 2—Regularly 3—Occasionally 8—Not applicable
60	*Food stamps* Record the appropriate code indicating whether the family *ever* purchased food stamps.	1—No 2—Yes 8—Not applicable
61–63	*Food stamps purchased* Record the actual amount in dollars (not cents) that the family pays per *month* for the stamps. If not purchased record 000.	Actual dollar amt. 000—Not purchased 888—Not applicable
64–66	*Food stamps value* Record in dollars (not cents) the *value* of the food stamps purchased by the family.	Actual dollar amt. 888—Not applicable
67	*Reasons for not getting food stamps or commodities* Indicate the reason which best describes why the family is not getting food stamps or commodities.	1—No need or disinterested. 2—Classified as not eligible. 3—Respondent does not think eligible. 4—Did not know about stamps. 5—Cannot afford. 6—Needs transportation. 7—Other reasons. 8—Not applicable 9—Unknown
75	*Completion code* Record the appropriate code regarding completion of form.	0—Completed 1—Refused 2—Not available 3—Informant incapable. 4—Other
78–80	*For tabulation use only*	Precoded
Card No. 4		
22–24	*Amount spent for food* Record the amount in dollars (not cents) actually spent for *food* last month. Include the value of food stamps if used.	Actual dollar amt. 999—Don't know.
25	*Amount usually spent for food* Determine if the amount spent for food last month (Columns 22–24) is the usual monthly expenditure. Record the appropriate code.	1—No 2—Yes 8—Not applicable
26–27	*Adequacy of storage space and burners* Record appropriate code reflecting respondent's attitude.	1—Adequate 2—Not adequate

Column Number	*Item and Explanation*	*Code*
28	*Adequacy of oven* Record appropriate code reflecting respondent's attitude.	0—None 1—Functions (work) 2—Does not function (work)
29	*Adequacy of refrigeration.* Record appropriate code reflecting respondent's attitude.	1—Adequate 2—Not adequate
30	*Kind of refrigeration* Record the code which describes the kind of refrigeration the respondent states they have.	0—None 1—Ice 2—Automatic 3—Home Freezer 4—Utilize Commercial Freezer 5—Automatic Combination R/F 6—Combination of any units above
31–33	*Shared facilities* Determine whether any of the facilities (cooking, refrigeration, and storage) are shared with another *household* and record the appropriate code.	1—No 2—Yes
76–77	*Interviewer number* Record the number assigned to you as an interviewer.	Actual number
75	*Completion Code* Record appropriate code.	0—Completed 1—Refused 2—Not available 3—Informant incap. 4—Other
78–80	*For tabulation use only*	Precoded

Dietary Form No. VIII B

24 Hour Recall—Household

Purpose: To obtain a record of food and beverage consumed by the household members during the 24 hours of the day previous to the interview. The data will be processed to provide a record of the nutrient intake of the household.

Completion: To be completed on the first one-half of the households (those whose household number (col 8-9) is an even number and who have a dietary code of 0 or 1.) The household consists of all related and/or all nonrelated persons residing in the dwelling unit who *ate* from the "common home prepared supply plus any visitor who ate a family-defined meal from that source. Record only food and beverage consumed from home source (includes meals carried from the source such as a packed lunch).

Respondent: The person responsible for the household's food preparation.

General Instructions

When the recall is being taken on the household, it is not necessary to allocate amounts consumed to specific individuals. Neither is it necessary to secure and record information on meals prepared or eaten outside of home.

It is important to remember that the *total* amount *consumed* and not amount *prepared* should be recorded. If some of the household had a portion of their meals elsewhere for the day of the recall, do not record. This factor will be corrected according to the information you record on Dietary Form No. VIII, Columns 33-36, MEALS EATEN YESTERDAY.

In helping the respondent recall amounts, keep in mind that pets may consume significant amounts of leftover food. Amounts of leftovers subtracted from amount prepared may not be amount consumed by the household. Keep this in mind where there are pets.

It is necessary to remind the respondent that you are interested in yesterday's intake, not in what usually is consumed. During the interview it will be helpful to use various household member's names in probing for intake such as, "did Johnnie have anything to eat or drink when he came home from school yesterday?"

When taking the recall it is usually easier for the respondent to give the menu or name the dishes eaten and then afterward tell ingredients which were used to make the dish. Stopping for details of the recipe becomes confusing to many respondents.

It is necessary to record accurately whether an item is *RAW* or *COOKED* so that the appropriate code number can be assigned. At the end of the recall you may find it helpful to read it back and ask if there was anything forgotten, candy, cocktails, etc.

Note in REMARKS if faddism, serious feeding problems, drastic deviations from normal, etc. were observed.

Should the food and beverage consumed take more space than is allotted on Dietary Form VIII B, attach a second sheet, being certain *all* identifying data is completed as on the first sheet. Label additional sheets to indicate page number of total number—e.g. page 2 of 4 sheets.

Column Number	*Item and Explanation*	*Code*
Card No. 2.		
1–15	*Identification data* Complete according to instructions for dietary Form VIII.	
16–21	*Date of Recall* Record month, day, and year of recall not of the interview.	Month 01–12 Day 01–31 Year 69,70, etc.
24–44	Refer to instructions on "Recording the 24-hour food intake."	
74	*Day of week of recall* Record day of week represented by recall.	1—Sunday 2—Monday 3—Tuesday 4—Wednesday 5—Thursday 6—Friday 7—Saturday

Column Number	*Item and Explanation*	*Code*
75	*Completion Code* Record as appropriate.	0—Completed 1—Refused 2—Not Available 3—Informant Incapable 4—Other
76–77	*Interviewer's Number* Record preassigned number.	Actual Number
78–80	Tabulation use only.	Precoded

Dietary Form No. IX

24-Hour Recall—Aging

Purpose: To obtain a record of the previous days' intake for persons 60 years of age and older and some specific information regarding food practices.

Completion: To be completed on all males and females 60 years of age or older in the second half of the households (those whose household number (col. 8-9) is an odd number).

Respondent: The individual on whom the data is being collected.

Column Number	*Item and Explanation*	*Code*
Card No. 1		
1–15	*Identification data* Complete according to instructions for Dietary Form No. VIII.	
16–21	*Date of recall* Record the month, day, & year of recall, not of the interview.	Month 01–12 Day 01–31 Year 69,70, etc.
22–27	*Date of birth* Record the month, day, and year of respondent's birth.	Month 01–12 Day 01–31 Year last two digits.
28	*Sex* Record appropriate code.	1—Male 2—Female
29	*Preparation of food* Determine who usually prepares food for the respondent. Record appropriate code.	1—Spouse 2—Self 3—Other household members 4—Other
30	*Food Stamps* Determine if the respondent purchases food stamps. Record appropriate code. If respondent lives with a second family (e.g., son and son's family) if they purchase food stamps, record appropriate code.	1—No 2—Regularly 3—Occasionally 4—Not certified 8—Not Applicable

Column Number	*Item and Explanation*	*Code*
31–33	*Major sources of food* Determine what the major sources of food are. Three sources can be recorded.	1—Self income (including Social Security) 2—Home procured 3—Welfare check 4—Family 5—Other 6—Welfare donated food 7—Food stamps 8—Not applicable
34	*Income of own* Record appropriate code.	1—No 2—Yes
35	*Eating with others of family* Record appropriate code.	1—No 2—Yes 8—Not applicable
75	*Completion code* Record appropriate code.	0—Completed 1—Refusal 2—Not available 3—Informant incapable
78–80	Card No. for tabulation use only.	Precoded
Card No. 2		
24–44	Refer to instructions on "Recording the 24-hour food intake."	
74	*Day of week of recall*	1—Sunday 2—Monday 3—Tuesday 4—Wednesday 5—Thursday 6—Friday 7—Saturday
75	*Completion code* Record appropriate code.	0—Completed 1—Refusal 2—Not Available 3—Informant Incapable 4—Other
76–77	*Interviewer's number* Record number assigned to you as an interviewer.	Actual Numbers
78–80	*Card number for tabulation use only*	Precoded

Dietary Form No. X

24-Hour Recall—Pregnant/Lactating Females

Purpose: To obtain a record of the previous day's intake for pregnant/lactating women and specific information regarding food habits during pregnancy or lactation.

Completion: To be completed on all pregnant and/or lactating women over 16 yrs. (If pregnant and/or lactating individual under 16 years of age, use Dietary Form No. XIII)

Respondent: The individual on whom the data is being collected.

Column Number	*Item and Explanation*	*Code*
Card No. 1		
1–15	*Identification data* Complete according to instructions for Dietary Form VIII.	
16–21	*Date of recall* Record the month, day, and year of the *recall*, not the interview.	Month: 01–12 Day: 01–31 Year: 69,70,etc.
22–27	*Date of birth* Record the month, day, and year of respondent's birth.	Month: 01–12 Day: 01–31 Year: last two digits
28	*Pregnancy status* Record the appropriate code to indicate pregnancy and/or lactating status. Pregnancy will be recorded as either first or second half; lactating likewise.	3—Pregnant 1° 4—Pregnant 2° 5—Lactating 6—Lactating and Pregnant 1° 7—Lactating and Pregnant 2°
29	*Changes in diet due to pregnancy* Determine if there has been any change, quantitatively or qualitatively. Record appropriate code.	1—No 2—Yes
30	*Reason for any changes in diet* Code according to numerical order for example, if the doctor and a family member told respondent to make the change, code "1" for doctor.	1—Doctor or clinic 2—Family member 3—Friend or Neighbor 4—Self-imposed 5—Other 8—Not Applicable
31	*Vitamin/mineral supplements* Record appropriate code.	1—No 2—Vitamins 3—Minerals 4—Both
32	*Calcium or iron supplements* Record appropriate code.	1—No 2—Calcium 3—Iron 4—Both

Column Number	*Item and Explanation*	*Code*
33	*Supplements prescribed by doctor* Record appropriate code. If a nurse in a clinic has "routine orders" from the doctor that all pregnant women are to take a supplement, code as doctor prescribed.	1—No 2—Both 3—Vitamins 4—Minerals 8—Not Applicable
34	*Pica* Determine if any of the items are eaten by the respondent and record appropriate code.	1—No 2—Starch 3—Dirt 4—Clay 5—Paper 6—Other and Combinations 8—Not Applicable
75	*Completion code* Record as appropriate.	0—Completed 1—Refused 2—Not Available 3—Informant incapable 4—Other
78–80	Card number. Tabulation use only.	Precoded
Card No. 2		
24–44	Refer to instructions for "Recording the 24-Hour Food Intake."	
74	*Day of the week of recall* Record appropriate code for day of the recall (not the day of the interview).	1—Sunday 2—Monday 3—Tuesday 4—Wednesday 5—Thursday 6—Friday 7—Saturday
75	*Completion code* Record as appropriate.	0—Completed 1—Refused 2—Not Available 3—Informant Incapable 4—Other
76–77	*Interviewer number* Record preassigned number.	Actual Number
78–80	Card No. 2 Tabulation use only.	Precoded

Dietary Form No. XI

Frequency

Purpose: To describe the usual pattern of usage of selected food groups and of some individual items. The results, and those from the 24-hour recall, will be descriptive of the food patterns.

Completion: To be completed on each dietary *household* in the first one-half of the households.

Respondent: Will be completed with same respondent as for Forms VIII. The homemaker is the usual respondent.

Column Number	*Item and Explanation*	*Code*
1–21	*Identification data* Complete according to instructions for Dietary Form No. VIII	
22–23	*Frequency of usage* Record the *number of times* (not amount) milk is served in the household. Do not include milk served to infants in a bottle.	Actual number 00—None 99—Unknown
24	*Interval* Record the appropriate code to indicate whether the interval for the number of times milk was served refers to daily, weekly, monthly, or yearly.	1—D-Daily 2—W-Weekly 3—M-Monthly 4—Y-Yearly

Example:

Item	No. of Times	Interval			
1. Milk (Beverage and cereals) a. whole fresh	(22 23) 0 8	D1	W2 2	M3	Y4 (24)

This would indicate that whole fresh milk is served eight times a week.

25–69 and 22–48 — The columns for number of times and interval for the rest of the foods should be completed as indicated above.

Explanation of food items

Item

1 Milk—Includes milk served for cereal as well as beverage. Chocolate and other flavored milk drinks are included here.

2 Poultry—Fresh, frozen, canned.

3 Fish—Fresh, frozen, canned, or dried.

4 Mixed Meat, Fish, Poultry Dishes (This refers to casserole-type mixed dishes.)

5 Meats—Refers to all types such as pork, veal, beef if served as "meat" in contrast to a mixed dish. Include luncheon meats, franks and meat used in sandwiches.

6 Eggs—Include eggs used in custards, puddings, etc.

7 Cheese and cheese dishes—Souffles, cheese sandwiches, etc.

Column Number	*Item and Explanation*	*Code*
	8 Soups—(Refer to food group 7 of above described food table. Exclude broth, bouillion and consomme without additional protein and/or carbohydrate.)	
	9 All dried or matured peas, beans, nuts, including peanut butter.	
	10 Cereals and grain products—Include all cereals, prepared or otherwise. Do not attempt to assess amounts. If at one meal both bread and rice served, consider this *one time*.	
	11a Fruits and Vegetables—High in vitamin C. Refer to your state's list representing local selections for this category of foods. Items included contain 35 mg. or more of Vitamin C per average portion size appropriate to the individual item. Fresh, frozen, canned, dried juices.	
	11b Vegetables high in Vitamin A—Refer to your state's list representing local selection for this category of foods. Items included contain 2500 I.U. or more of Vitamin A per average portion size appropriate to the individual item. Fresh, frozen, canned, dried juices.	
	12 Include all other fruits and vegetables—Fresh, frozen, canned, dried, juices.	
	13 Pastries and other desserts—Include *all* types—milk desserts such as custards or ice cream, pies, cakes, sweet buns, etc.	
	14 Jams, jellies, candies—All types.	
	15 Beverages a. Sweetened beverages—Cola type, kool-aids, bottled, canned, or home prepared. b. Artificially sweetened—All types if sweetened artificially. c. Coffee and/or tea. d. Beer, ale, or homebrew e. Wines f. Whiskey, gin, vodka, rum—any highballs, cocktails, etc., using these.	
	16 Snack Foods—Include usual "snack type" foods such as potato chips, popcorn, etc. An in-between meals piece of fruit or sandwich is not to be classified as "snack food".	
49–51	*Eating together* For each meal record the appropriate code to indicate how many of the family eat together. Eating together refers to eating at the same time (perhaps some may eat on TV trays and others at the table).	1—All 2—None 3—Some

Column Number	*Item and Explanation*	*Code*
52–57	*Eating out* Record the actual number of family members who usually eat one or more meals from a source other than the household. A lunch carried from home and eaten out is *NOT* considered eating out.	Actual number
58–59	*Total number of persons in household* Record the total number of persons in the household as obtained from Form No. I. Do not include guests in this number.	Actual number
76–77	*Interviewers number* Record the number assigned to you as an interviewer.	Actual number
75	*Completion Code* Record the appropriate code regarding completion of form.	0—Completed 1—Refused 2—Not Available 3—Informant Incapable 4—Other
78–80	*For tabulation use only*	Precoded

Dietary Form No. XII

24-Hour Recall—Adolescents

Purpose: To determine the previous day's total (food and beverage) intake, some general questions relative to food habits, and specific questions for any pregnant respondent who is in this age group.

ALL FOOD AND BEVERAGE (regardless of source or place it is eaten) SHOULD BE RECORDED.

Completion: To be completed on all males and females 10—16 years of age.

Respondent: The boys and girls identified above. It is suggested that they be interviewed apart from the mother or "mother-figure" to avoid parental influence.

Column Number	*Item and Explanation*	*Code*
Part A		
1–15	*Identification data* Complete according to instructions for Dietary Form No. VIII.	
16–21	*Date of recall* Record the month, day, and year of the *recall* not the interview.	Month: 01–12 Day: 01–31 Year: 69,70,etc.
22–27	*Date of birth* Record the month, day, and year of respondent's birth.	Month: 01–12 Day: 01–31 Year: 69,70,etc.

Column Number	*Item and Explanation*	*Code*
28	*Sex and pregnancy status* Record the appropriate code to indicate sex and pregnancy and/or lactating status. Pregnancy will be recorded as either 1st or 2nd half; lactating likewise.	1—Male 2—Female 3—Pregnant 1° 4—Pregnant 2° 5—Lactating 6—Lactating and Pregnant 1° 7—Lactating and Pregnant 2°
Part C		
24–44	*Refer to Instructions "Recording the 24-Hour Food Intake"*	
49	*Source of food* Record the code which indicates the source of the food item: *Home* includes all food from the home supply including packed lunches. *School* includes any school meal (including day camp) regardless of method of payment. *Work* includes food received for work performed (excluding school meals). *Self-purchased* includes all food which is purchased exclusive of school lunch. Vending machine items purchased at school are included. *Other* includes food from any other source.	1—H Home 2—Sc School 3—W Work 4—P Self Purchased 5—O Other
74	*Day of week of recall* Sunday—1, Monday—2, etc.	1—7
75	*Completion code* Record as code appears on form.	0—4
76–77	*Interviewer's number* Record your preassigned number.	Actual Number
78–80	*Tabulation use only*	Precoded
Part B		
29	*Attending school* Record appropriate code indicating whether respondent usually attends school when it is in session.	1—No 2—Yes
30	*School lunch program* Lunch program refers to *any* organized type of lunch program. Canteen or vending machine type service is *not* considered a lunch program.	1—No 2—Lunch program; doesn't eat 3—Lunch program; eats 8—Not applicable
31	*Employment* Employment is interpreted as the respondent receives money for services performed. Full time is considered to be 35 or more hours per week.	1—No 2—Employed full time 3—Employed part time

Column Number	Item and Explanation	Code
32	*Usual eating pattern* Determine if the recall taken is the way the respondent usually eats. If not, determine reason. Record appropriate code.	1—Yes 2—No; Respondent ill 3—No; Respondent had no money 4—No; other reasons 8—Not Applicable
33	*Pica* Determine if any of the items are eaten by the respondent and record appropriate code.	1—No 2—Starch 3—Dirt 4—Clay 5—Paper 6—Other and combinations
34	*Vitamin and mineral supplements* Record appropriate code.	1—No 2—Vitamins 3—Minerals 4—Both
35	*Calcium or iron supplements* Record appropriate code.	1—No 2—Calcium 3—Iron 4—Both
36	*Supplements prescribed by doctor* Record appropriate code. If a nurse in a clinic has "routine orders" from the doctor that all pregnant women are to take a supplement, code as doctor prescribed.	1—No 2—Both 3—Vitamins 4—Minerals 8—Not Applicable
37	*Changes in diet due to pregnancy* Determine if there has been any change, quantitatively or qualitatively. Record appropriate code.	1—No 2—Yes 8—Not Applicable
38	*Reason for any changes in diet* If more than one person told the respondent to make the change, code according to numerical order. For example, if the doctor and a family member said to make the change—code "1" for doctor.	1—Doctor or Clinic 2—Family member 3—Friend or Neighbor 4—Self-imposed 5—Other 8—Not Applicable
75	*Completion code* Record the appropriate code regarding completion of form.	0—Completed 1—Refusal 2—Not available 3—Informant incapable 4—Other
76–77	*Interviewer's number* Record the number assigned to you as an interviewer.	Actual number
78–80	*For tabulation use only*	Precoded

Dietary Form No. XIII

24-Hour Recall for 0-36 Months

Purpose: To determine the previous day's intake as well as some general data pertinent to early food habits of the subject.

Completion: To be completed on all males and females 0-36 months of age. See general guidelines for setting priority if there is more than one infant in this age group.

Respondent: The person responding for the household; probably the homemaker or mother.

Column Number	*Item and Explanation*	*Code*
1–15	*Identification data* Complete according to instructions for Dietary Form No. VIII	
16–21	*Date of recall* Record the month, day, and year of recall, not the interview.	Month: 01–12 Day: 01–31 Year: last two digits
22–27	*Date of birth* Record the month, day, and year of birth of the subject.	Month: 01–12 Day: 01–31 Year: last two digits
28	*Sex* Record appropriate code.	1—Male 2—Female
74	*Day of week of recall* Record appropriate code for day of recall, *not* the day of the interview.	1—Sunday 2—Monday 3—Tuesday 4—Wednesday 5—Thursday 6—Friday 7—Saturday
75	*Completion code* Record the appropriate code regarding completion of form.	0—Completed 1—Refused 2—Not available 3—Informant incapable 4—Other
76–77	*Interviewer's number* Record the number assigned to you as an interviewer.	Actual number
	Part A	
29–30	*Breast fed* If child is breast fed, determine the number of times and record the number.	Actual number 00—None
31	*Breast fed* If child is breast fed, determine schedule and record appropriate code.	1—Schedule 2—Self demand 8—Not applicable

Column Number	*Item and Explanation*	*Code*
32–33	*Bottle fed* If the child is bottle fed, determine the number of times and record the number.	Actual number 00—None
34	*Bottle fed* If the child is bottle fed, determine schedule and record appropriate code.	1—Schedule 2—Self demand 8—Not applicable
35	*Dry skim milk in formula* If dry skim milk was used in the formula, determine if it was part of donated foods. Record appropriate code.	1—Yes 2—No 8—Not applicable
	Part B	
	General Instructions This section of the form is to record yesterday's intake of *all* formula or milk consumed from a bottle (any other milk from cup or glass is recorded in Part C). Occasionally, the mother may use part of the bottle milk on the infant's cereal. It is not necessary to separate this from the calculation. Assume it was consumed from bottle.	
24	*Ingestion Period*	Precoded
25–29	*Food Item Code* The most common formula items are precoded.	Precoded or FOOD ITEM CODE from Master Dietant
	If the item used is not precoded, each item consumed will be coded *after* the interview per prearrangement of dietary director.	
	Formula Item Record as accurately as can be determined *what* was used to prepare the formula.	
	Work Area Used for computations to determine the total volume of formula and what the infant consumed.	
30–34	*Amount prepared* Record *number of units* of the item. This shall always be a numerical entry.	Actual number
35–39	*Amount prepared* Record the *unit* such as cup, ounce, or gram. This shall always be an alphabetical entry.	Actual unit
40–44	*Amount consumed* TO BE USED ONLY IF PART OF FORMULA IS CONSUMED.	
	Specific Instructions 1. Determine type of milk used and circle it. If this was a commercial formula of any type, write in brand name (if the brand used is not	

listed in the Master Dietant File, the Coder should contact the Nutrition Program, PHS for code number and procedure relative to nutrients). Once brand has been determined, proceed as follows:

2. Under Work Area:
   (a) Record total amount *milk* used to mix formula, e.g. used 1 can evaporated of 14½-oz. size. Record this opposite appropriate item.
   (b) Record water used, e.g. added same amount of water as milk.
   (c) Record amount of sugar, syrup, or other additions used in formula, e.g. used 2 Tb. sugar.
   (d) Sum the formula volume, including all milk, formula, and water.
   Note: Sugar, syrup, or other additive is not totalled in with total volume.
   (e) Fill in Columns 30–34 and 35–39 as shown in the following diagram. This may be completed at the office.
   Note: Water and total volume are not recorded in these columns.
   (f) Refer to the previously recorded number of bottles consumed (Col. 32–33). Ask if baby consumed all of the formula.
      1. If the answer is yes, continue to Part c of form.
      2. If answer is no, inquire how much he took from each bottle.

Example:
1 bottle—6 oz.
1 bottle—3 oz.
1 bottle—6 oz.
1 bottle—4 oz.
1 bottle—4 oz.
Total: 23 oz.

This may be computed in work area as shown in diagram. Note that the baby consumed 23 oz. of the 29 oz. prepared. To arrive at the percent consumed. Compute as follows:

$$\frac{\text{Amount consumed}}{\text{Total formula volume}} = \text{percent consumed}$$

For this example: $\frac{23}{29} = .79$

Column Number	*Item and Explanation*	*Code*
	Since baby consumed .79, complete column 40–44 as shown in diagram. This will indicate to the computer to calculate 79% of the 14.5 oz. of milk and 79% of the two tablespoons of sugar for nutrient determinations. Complete computation in office.	

Formula Item	Work Area	Amount Prepared		Amount Consumed if less than Total
		I	II	III
		30–34	35–39	40–44
Milk Fresh Whole	.79 29)23.00	14.5	oz.	X.79
Evaporated	14.5 oz. 203			
Condensed	1–6 oz. 270 1–3 oz. 261			
Dry Skim	1–6 oz. 1–4 oz.			
Commercial Formula	1–4 oz. 23 oz.			
Water	14.5 oz.			
TOTAL FORMULA VOLUME	29 oz.			
Sugar	2 Tb.	2	Tb.	X.79
Syrup (Corn)				
Other (specify)				

PART C

Part C will be used to record all food and beverage consumed yesterday other than that taken from the bottle.

Column Number	*Item and Explanation*	*Code*
24–48	Refer to instructions "recording the 24-hour food intake."	
49	*Source of Food* Record appropriate code which indicates the source of the food item: *Table food* is food from the table food that other family members use. *Home prepared* is food *especially* prepared for the child. *Baby food* is the commercially prepared. *Junior food* is the commercially prepared. Note: It is not necessary to record brand name of commercially prepared foods.	1—T–Table food 2—H–Home prepared especially for the baby 3—B–Baby food 4—J–Junior food

Column Number	*Item and Explanation*	*Code*
	PART D	
36	*Usual eating pattern* Determine if the recall taken is the way the child usually eats. If not, determine difference and reason. Record appropriate code.	1—Yes 2—More food 3—Less: illness 4—Less: no food available 5—Less: mother ill 6—Less: other
37	*Vitamin and mineral supplements* Record appropriate code.	1—No 2—Vitamins 3—Minerals 4—Both 9—Unknown
38	*Vitamins and/or minerals taken daily* Record appropriate code.	1—No 2—Yes 8—Not applicable 9—Unknown
39–40	*Age vitamin and/or mineral supplements began* Record child's age in months to indicate when he started taking them or appropriate code.	Age in months 88—Not applicable 99—Unknown
41	*Ever breast fed* Record appropriate code.	1—No 2—Yes 9—Unknown
42–43	*Other milks started when, if breast fed* Record child's age in months to indicate when he began taking other milks or use other appropriate code.	Age in months 77—Not yet 88—Not applicable 99—Unknown
44–45	*Age weaned from breast* Record child's age in months to indicate when he was weaned from breast or use other appropriate code.	Age in months 77—Not yet 88—Not applicable 99—Unknown
46–47	*Age weaned from bottle* Record child's age in months to indicate when he was weaned from the bottle or use other appropriate code.	Age in months 77—Not yet 88—Not applicable 99—Unknown
48–49	*Age non-milk foods started* Record child's age in months to indicate when he started taking non-milk foods or use other appropriate code.	Age in months 77—Not yet 99—Unknown
75	*Completion code* Record the appropriate code regarding completion of form.	0—Completed 1—Refusal 2—Not available 3—Informant incapable 4—Other

Column Number	*Item and Explanation*	*Code*
78–80	*For tabulation use only*	Precoded

Recording the 24-Hour Food Intake

A. Models for Assessing Portion Size

The use of food models in surveys is not new. However, the models to be used in the Ten-State Nutrition Survey are unique in that they have been designed in conjunction with a program for data processing. Nutritionists and dietitians are familiar with more conventional survey methods which consist of (a) collecting dietary information and recording it in household portions then (b) converting the household portion to gram weights so that (c) nutrient values may be determined. The conversion of intake to gram weights is necessary because most tables of nutrient values are based on gram weight of foods.

For the Ten-State Nutrition Survey, an electronic computer will be used for determining the nutritient values of food consumed. The program for processing the data will be based on a food composition table which includes the 2483 food items appearing in *U.S. Department of Agriculture Handbook No. 8 (1963)*, Table No. 1 plus additional foods as needed to comply with those respondents report they consume. The food table (dietant) lists nutrients based on the amount of each nutrient in 100 grams of the specific food item.

The models have been designed to assist interviewers in securing from the respondent the amounts of food consumed. They have also been designed so that the computer can take the alphabetic code assigned to each model, make necessary mathematical computations based on the size of the model, and arrive at (1) the grams of a food consumed then (2) the nutrients from the amount of food consumed. An over-simplified explanation of what will occur is demonstrated by the following example:

1. A respondent may answer: "My family ate applesauce in the amount of twice model 'S' yesterday."
   a. The interviewer will record as follows:

Food Item	*Columns (30–34)*	*Columns (35–39)*
Applesauce	2.	S

   b. The computer will automatically know the gram weight of applesauce based on the food code numbers recorded in Columns 26–29, understand that model "S" refers to ¾ cup and make necessary calculations.
2. The respondent may have answered: "My family consumed spaghetti in the amount of twice model 'S' yesterday."
   a. The interviewer will record as follows:

Food Item	*Columns (30–34)*	*Columns (35–39)*
Spaghetti	2.	S

   b. The computer's automatic calculations know that the gram weight and nutrient values for spaghetti are different from applesauce since the food code number is different. It will then make necessary calculations to get nutrient values for this different item although *measured* with same model.

Thus, THE CORRECT USE OF THESE MODELS WILL ELIMINATE THE TEDIOUS, TIME-CONSUMING procedures of converting each household measure to the gram weight.

It is necessary, however, that data be recorded in a specific and consistent way. Therefore, each interviewer must be thoroughly familiar with the portion size models and the appropriate method of using them.

Three basic principles should be noted:

1. Food items which *generally* are recorded by a weight measure are recorded by models and measures based on 1 ounce (28 grams). This will hereafter be referred to as a WEIGHT MEASUREMENT. No other method of recording may be used for recording these items.
2. Food items which *generally* are recorded by a volume measure are recorded by models and measures based on weight of ⅛ cup of the specific food. This will hereafter be referred to as a CUP MEASUREMENT. No other method of recording may be used for recording these items.
3. Food items which *generally* are recorded by a "unit" (examples; 1 apple, or 1 banana, or 1 egg) are based on a reference weight for a unit. This will hereafter be referred to as a UNIT MEASUREMENT. No other method of recording may be used for recording these items.

THE ONE EXCEPTION THAT HOLDS FOR *ANY FOOD*, regardless of the three above principles, is that ANY FOOD MAY ALWAYS BE RECORDED IN GRAMS IF THE INTERVIEWER PREFERS.

Now—let us examine the model kit. It is important to understand that the models are not intended to be models of any one food. Rather, they are models designed to assess portion size.

These are the models and their alphabetic code that you will find in the kit:

MODEL	*TYPE MEASURE*	*ALPHABETIC CODE*	*NUMERIC EQUIVALENT*	*APPROXIMATE HOUSEHOLD MEASUREMENT EQUIVALENT*
Cups	Cup	A	10.00	1¼ cups
		S	06.00	¾ cup
Glasses	Cup	B	11.00	1⅜ cups
		V	09.00	1⅛ cups
		Q	05.00	⅝ cup
Spoons	Cup	SS	00.70	1½ TBS
		CC	00.50	1 TBS
		M	00.30	½ TBS
		E	00.20	1 TSP
Mounds	Cup	C	16.00	2 cups
		S	06.00	¾ cup
		Z	02.50	⅓ cup
		J	14.00	1¾ cups
		S	06.00	¾ cup
		Z	02.50	⅓ cup
Bottles/cans	Cup	A	10.00	1¼ cups
		W	12.00	1½ cups
		C	16.00	2 cups
		W	12.00	1½ cups
		A	10.00	1¼ cups
		S	06.00	¾ cup
Meats	Weight	H	01.50	1½ oz.
		S	06.00	6 oz.
		C	16.00	1 lb.
		U	31.00	2 lb.
		SM	01.00	1 oz.
		MED	02.50	2½ oz.
		LG	05.00	5 oz.
		Y	03.00	3 oz.
French Bread	Unit	UNIT		34 gms.
Butter/margarine	Weight (pat)	E	00.20	⅕ oz.
Pie	Weight	D	04.00	4 oz.
		Q	05.00	5 oz.
Discs	Weight	E	00.20	⅕ oz.
		M	00.30	⅓ oz.
		CC	00.50	½ oz.
		MM	00.60	⅔ oz.
		G	01.00	1 oz.
		H	01.50	1½ oz.
Boxes	Dimension		π 20.4 cubic in.	(1¾″ × 2¾″ × 4¼″)
			Σ 6.25 cubic in.	(2½″ × 2½″ × 1″)
			Δ 15.9 cubic in.	(⅒ of 10″ circle, 3¼″ high)

The numeric equivalent indicates the MEASURE (either weight or volume) depending upon the food item. If the model's equivalent is 10.00, and this is a weight measure food item, the equivalent is interpreted by the computer to mean 10 ounces. On the other hand, if this is a cup measure food item, the computer would interpret the numeric equivalent of 10.00 to mean 1¼ cups. (10.00 × ⅛ cup.)

You will note that an alphabetical code letter is used on more than one type of model. For example, the code letter "S" appears on a cup and also on fish. This is because the numeric equivalents are the same—the fish model is 06.00 indicating 6 ounces while the cup model is 06.00, but this would indicate ¾ cup. (06.00 × ⅛ cup.)

YOU WILL NOT NEED TO LEARN ANY OF THE EQUIVALENTS. THIS SECTION WAS ONLY GIVEN FOR BACKGROUND. YOU NEED ONLY KNOW WHICH MODELS TO USE IN RECORDING INTAKE. THIS IS IMPERATIVE.

A *Guide for Use of the Models* has been developed. This Guide indicates the preferred model (which is generally the manner in which that food item is measured) and alternates. It also indicates which models cannot be used for each food group. Improper recording of food models can result in either gross over or under-estimation of nutrient intake.

The Ten-State Nutrition Survey will include data on household intake, as well as individual intake. Therefore, for example, some respondents may find it easier to answer that their family consumed one-half gallon container of milk than to estimate amount by use of one of the food models.

Standard measurements and the abbreviation code allowed in the computer program are:

Gram	GM or GMS
Ounce	OZ
Pint	PT
Quart	QT
Half-Gallon	HFGAL
Pound	LB
Cup	CUP
Tablespoon	TBS
Teaspoon	TSP
Unit	UNIT or UNITS

These abbreviations and the model alphabetical codes are the ONLY acceptable ways that foods may be recorded. *DO NOT* use a period after the abbreviation.

Reported intake will not always correspond to the exact size of the model. Detailed, specific rules for recording intake appear in the following section. However, some general rules specifically related to the models are:

1. Glasses (B, V, Q). Marks are placed at the ¼, ½, and ¾ volume level. The top mark shows the full volume of the glass as it is considered by the computer. Example: Glass Model B at the full level *mark* is 1⅜ cups; not if it is filled "to the brim."
2. Meat (C, U). Lines appear on the sides of these models. They represent ¼, ½, ¾, and ⅞ of the thickness. These lines will be needed should the respondent state amount consumed was different thickness from the model.
3. Ruler. This model is to assist with dimensions or with disc models should the thickness of the food consumed—as estimated by the disc—be greater than ⅛". The three-inch ruler is marked in inches and also ⅛" units. Along the side marked with inches, there are ¼", ½", and ¾" markings. Note that a "2" is by the ¼" marking. This implies 2 units of ⅛", since the disc is based on ⅛" thickness.
4. Boxes—Greek Letter Code. These models are for use in estimating and subsequently weight of those items so indicated in the *Guide for Use of the Models* (Cheese, Cake.) If the interviewer can arrive at size—and subsequently weight—in an easier method, these models need not be used.

B. Recording and Coding the 24-Hour Food Intake

Guidelines for recording and coding the 24-hour recall follows. The directions apply to all recall forms whether for the household (VIII B), the pregnant and lactating female (X), the aging (IX), the adolescent (XII), or the infant (XIII). In each of the these forms, Columns 22–44 are identical and the same guidelines apply.

This section is reproduced below for easy referral.

Ingestion period code	Food codes					Food and beverage consumed		Work area for computations	Size of edible portion serving			Time of day
									I	II	III	
(24)	(25)	(26)	(27)	(28)	(29)	Food item	Description	*(If needed)*	(30–34)	(35–39)	(40–44)	(45–48)

Step 1: TIME OF DAY COLUMN

Record in this column the actual time the first food or beverage was consumed. Approximate times are sufficient; exact minutes are not needed; however, if respondent is specific, record minutes as given.

Step 2: FOOD ITEM AND DESCRIPTION COLUMN

Record in these columns the *exact* food or beverage consumed.

(a) Name of item
(b) Description (raw, dry, frozen edible portion or as purchased)
(c) Preparation method (fried, broiled)
(d) Major ingredients (if a mixed dish)

Step 3: WORK AREA FOR COMPUTATIONS (if needed).

Use the work area to enter any necessary information to describe the item and the probable amount if the specific amount cannot be entered in Columns 30–44 immediately. For example, the food item is reported to be the size of Σ (a dimensional model) and additional calculations are needed to arrive at the weight—OR—respondent cannot estimate size by one of the "acceptable models", necessitating additional later calculations. If the Greek letter models are used, they are *always* recorded here.

Step 4: SIZE OF EDIBLE PORTION SERVING (COLUMNS 30–44).

These columns determine the basis on which the nutrient intakes are calculated.

a. *I (Columns 30–34)*
These columns are to be used to record the number of units or portion of a unit consumed. This shall always be a numerical entry. The numbers recorded here may be integers, fractions, decimal fractions, or mixed numbers.

Examples:

1 (Integer)
¾ (Fraction)
.50 (Decimal fraction)
1½ (Mixed numbers)

Coding the recorded numerical entry

1. All integers must be recorded with a trailing decimal.
   Example: 1.
2. All decimal fractions must be recorded with leading zero and decimal point clearly marked.
   Example: 0.50
3. All fractions must be recorded with a leading zero.
   Example: 0¾
4. When fractions are recorded, the numerator must be smaller than the denominator. The numerator is limited to one digit.
   Example: 0½ or 0¾, NOT 0$^{11}/_{12}$ or 0⅔

b. *II (Columns 35–39)*
These columns are used to record the model letter code or abbreviation code which describes the measure of the food item consumed. This should always be an alphabetical entry.

The possible acceptable entries are:

A, S	(Cups)
B, V, Q	(Glasses)
SS, CC, M, E	(Spoons)
C, S, Z, J	(Mounds)
A, W, C, S	(Bottles/cans)
H, S, C, U, Y, SM, MED, LG	(Meats)
E	(Butter)
D, Q	(Pie)
E, M, G, H, CC, MM	(Discs)

ABBREVIATION CODES

GM or GMS
OZ
PT
QT
HFGAL
LB
CUP
TBS
TSP
UNIT or UNITS
SKIPO

Special symbols can be used whenever the respondent uses two models to describe the size serving. The symbols are as follows:

SYMBOL	*DEFINITION*	*USE*
=	(range)	Respondent states the serving is between two models.
+	(add)	Respondent ate the equivalent of two models.
—	(subtract)	Respondent served one model, had the equivalent of another model left-over.

When using these special conditions, the smaller model should be recorded to the *left* of the sign.

Examples: (Refer to kit to note sizes of two models.)

S = A
S — A
S + A

Examples of data which may be recorded in Columns 35–39:

RESPONSE	*RECORD*
Serving was Rice Model Z	Z
Serving was one apple	UNIT
Serving was more than Bean Model Z but less than Bean Model S	Z = S
Serving was Bean Model Z plus Bean Model S	Z + S
Serving was Bean Model S, but respondent left amount of Bean Model Z portion	Z — S
Serving was a quart	QT

c. *III (Columns 40–44)*

These columns are used to modify the number of units or portion of a unit consumed which was recorded in I (Columns 30–34). In general, Columns 40–44 are not used frequently. If respondent changes answer, rather than erasing in either columns, use Columns 40–44 for modifications.

Two arithmetical symbols may be used to indicate the type of computation desired. "X" shall be used to denote multiplication; "/" for division. The numbers which follow these symbols shall always be numerical entries—integers, decimal fractions or fractions; the rules for recording these numerical entries are the same as for I (Columns 30–34). Examples of modifications:

(1) Amount prepared to amount consumed (Left-over).

Respondent indicates that 5# beef roast was put on the table but half of it (50%) was not consumed.

Possible modifications to be recorded in Columns 40–44:

X 0.50
X 0½
/ 2.

(2) Disc model's thickness is greater than ⅛ inch. If respondent indicates the thickness was the "4" on the ruler, record × 4. in Columns 40–44.

(3) Household serving to individual amount when models are not applicable.

Respondent states 24-month-old son ate about ⅛ of the beef stew that was prepared for the household unit: Total prepared was 7½ CUPS. Record: /8 under III (Columns 40–44).

Caution: If a fraction is used in these columns to modify portion or unit, the numerator CANNOT be greater than 1. Example: ¼, ½, ⅓; NEVER ¾, ⅝, etc.

Step 5: a. Before any household recall interview is completed, the dietary interviewer

Ingestion period code	Food codes					Food and beverage consumed		Work area for computations	Size of edible portion serving			Time of day
									I	II	III	
(24)	(25)	(26)	(27)	(28)	(29)	Food item	Description	(*If needed*)	(30–34)	(35–39)	(40–44)	(45–48)
2		9	9	9	9				1.	SKIPO		

should verify that food consumed conforms to Columns 33–36 on Form VIII. All ingestion period *when something from home source was consumed* by any member of the family has to be accounted for. Compare ingestion periods with Form VIII, Columns 33–36, to be certain that all times when food was consumed from the home source are accounted for.

b. When completing 24-hour recall on any individual, *all* ingestion periods must be accounted for whether anything was consumed or not. If there is an ingestion period for which no food was consumed, record as follows —Example: no noon meal. Record as shown:

Step 6: After the INTERVIEW, the Ingestion Period must be inserted.

a. Column 24—Ingestion Period. Refer to code on Dietary Form.

b. Columns 25–29—Food Code: Use Dietant or Shortened List.

c. Columns 30–44—Size of Edible Portion Serving:

This will have to be completed if work area was used during the interview to record description of amount rather than the entry being made in these columns. Note the following example:

Example: A respondent consumes a serving of gingerbread which was twice the size of the Model marked Σ.

Step 1: Arrive at total number of cubic inches consumed.

Since Σ = 6.25 cubic inches, twice that size would mean the gingerbread consumed was the equivalent of 12.50 cubic inches.

Step 2: Secure gram weight for a specific size of the food item.

By referring to a standard reference such as USDA Handbook No. 72, it may be noted that a 2″ × 2″ × 2″ (8 cubic inches) piece of gingerbread weighs 55 grams.

Step 3: Calculate grams per cubic inch.

$$\left(1 \text{ cu. in.} = \frac{\text{number of gms.}}{\text{number of cu. in.}}\right)$$

If 8 cubic inches weighs 55 grams, 1 cubic inch weighs 55 + 8 or 6.87 grams or 7 grams (rounding to nearest whole number).

Step 4: Calculate gram weight of item consumed.

Thus, the piece of gingerbread consumed, which was 12.5 cubic inches, would weigh 12.5 × 7 gm., or 87.5 gms.

Step 5: Transfer to proper columns.

Cols. (30–34)	Cols. (35–39)
88.	GMS

WRISTBONE X-RAY

The determination of wristbone X-ray is an important part of the Ten-State Nutrition Survey. In order to produce satisfactory X-rays, the Nutrition Program has contracted with Dr. Stanley Garn, Center for Human Growth and Development, The University of Michigan, to provide standardization of the portable X-ray unit and training for the field operators. A description of the unit to be used is attached, as well as general instructions for assembling and operating the unit. A series of specific instructions has been devel-

oped by Dr. Garn, including some general safety precautions. However, it is essential that the instrument be tested under the field conditions and that it be shielded in a manner which meets the regulations of each individual state. Dr. Garn and his staff are prepared to assist in these safety evaluations. Background information from other surveys is available. Since regulations vary from state to state, acceptable shielding procedures in one state may not be satisfactory in other states.

Regulations Regarding Radiation Safety

1. With an output of 40 mr at the base, air dosage, there is not more than 1 mr measured dosage on the outside of the tubehead shield.
2. At three feet from the central ray, marked by the cross on the base, the air dosage is below 0.5 mr per exposure.
   The instrument is, therefore, safe under the conditions given, but at no time must the milliampere setting be allowed to exceed 20 Ma.
3. To prevent over-heating, not more than 60 radiographs should be taken per hour ($60 \times 50\text{PKV} \times 20\text{ Ma} \times 3\text{ sec} = 180{,}000$ heat units).
4. The two-millimeter aluminum filter *must* be in place at all times.
5. The technician must stand a minimum of four feet from the machine, must wear a lead-rubber apron, and all persons regularly using the machine must be given the protection of an independent badge service.
6. Lead rubber should be placed under the baseboard and, furthermore, no subject should be seated so as to allow legs or thighs in the direct beam path.

General Procedure for Taking X-rays

1. Write (print) on the corner of the film the following:
   Date
   Name of subject, sex, age
   Number of subjects
2. Place the film on the base. Make sure that the vertical and horizontal lines are in line with those of the base.
3. Place the left hand of the subject on the middle of the film. Make sure that the wrist is also included. Pass the left hand of the subject through the lead shield and place it on the middle of the film. NOTE: Make sure the fingers are slightly separated and the hand *including* the *wrist* rest slightly on the film.
4. Set the timer as follows: (This should be determined for each machine based on results of developed X-ray.)
   1 second for children between one month to 5 years of age.
   1½ seconds for children between 6 and 10 years of age.
   2 seconds for children between 11 and 15 years of age.
   2½ seconds for subjects between 16 and 20 years of age.
   3 seconds for adult subjects.
5. Press the push button of the timer until the timer stops.

X-ray Film

At the present time, we are contemplating the utilization of X-omat RPS film. This film can be processed in automatic equipment. Detailed information on this film and its processing should be obtained from Dr. Garn. Facilities to process film locally are necessary in order to ensure that satisfactory films are being produced on a day to day basis.

20-80 Portable X-ray Unit

Uncrating and Mechanical Assembly

Unpack unit carefully and be sure to check items with the packing list.

Units shipped with carrying cases will be packed in these cases, as normally used.

1. To assemble the tubestand, place the wooden base flat on a table.
2. Place the lower end of the tubestand column into the base bracket, so that the threaded stud enters the hole in the base bracket. Tighten the column in position with the lock knob provided.
3. With the crank, as shown in figure 1, place the carriage on the tubestand so that the lower roller rides against the flanges of the tubestand column and the upper roller rides against the bar.
   Move the carriage down until it engages the hook on the elevating screw of the column.
4. To place the X-ray tubehead in position on the carriage, insert the tubefork shaft

into the hole on the carriage. With the tube fork shaft angled down slightly, push in until the end of the shaft finally passes the second obstruction. When this happens, you will be able to see the end of the shaft by looking between the upper edge of the carriage and the column. When the weight of the tubehead is allowed to rest on the fork, the tube fork shaft will seat itself in the carriage so that it cannot come out unless you lift the weight of the tubehead from this tube fork shaft.

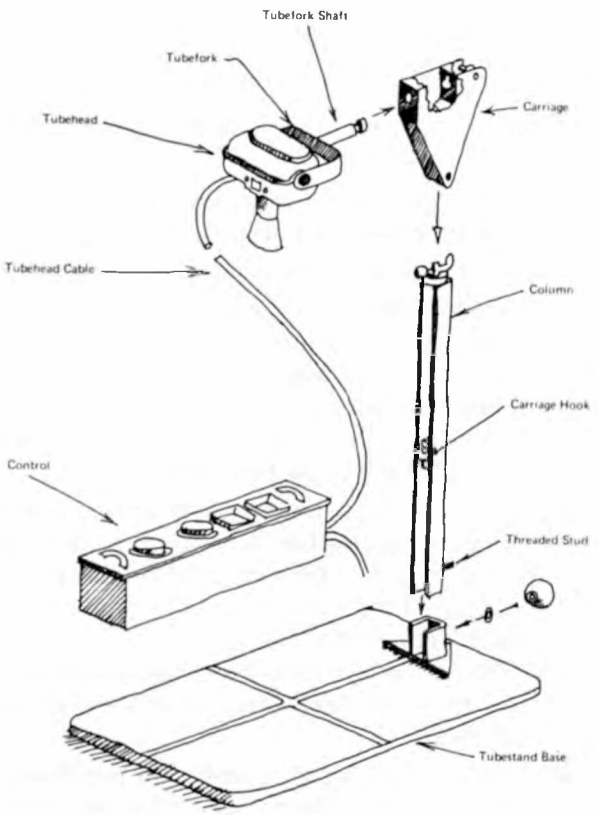
The tubehead is positioned for height by turning the small crank at the top of the tubestand column. Focal distance is measured and read on the scale of the tubestand column. Use the top edge of the tube carriage as the index point.

Electrical Operation

Power Supply: For 110 volt, 50 and 60 cycle units, the unit operates from a 115 volt supply. Look at the rating plate to see the frequency at which the machine is to be operated.

The line cord for this unit is fitted with a three-prong plug of an approved design for connecting to power supply. Two standard blades are for carrying the power and the third is a grounding pin for providing ground connection for all non-current carrying parts of the control and X-ray tubehead. A suitable wall receptacle for accepting this plug should be installed if one is not already available. Be sure that the receptacle is properly connected to ground.

FIGURE 1



Connecting the Tubehead: Insert the six-prong female receptacle on the end of the rubber covered cable into the six-prong male plug on the tubehead. The connectors are so keyed that they can only be put together one way. Push the receptacle on as far as it will go, then screw on the lock nut until it is tight.

Timer and Footswitch: The control can be operated from either a timer or a footswitch which is connected to the control through the three-prong receptacle in the lower right-hand corner of the control panel labeled "FOOTSWITCH TIMER".

The timer may be used either as a timer or push button. If used as a timer, the desired time may be set on the dial face. If after setting the timer a longer or shorter time is desired, the new time can be set by moving the dial to the new time. To use as a push-button, push the button without setting the timer dial.

Operation of Control Unit: The control unit has the following devices on it:

Main Switch.
Light Switch for the meter lights.
Receptacle for either a timer or a footswitch.
Receptacle for 110 volt operation of auxiliary components.
Knob for controlling a filament circuit.
Knob to set the kilovoltage.

The kilovolt meter is of the load-on type—that is, it reads correctly only when the machine is producing X-rays. It will be noticed that when the timer button is pushed, the kilovoltmeter reading decreases slightly. This new reading indicates the correct kilovoltage. The amount that the reading decreases depends on the milliamperes. If the drop is very great. it may be that the power line to which the machine is connected is not adequate for the machine, and a heavier one will have to be installed. However, this will not affect the accuracy of the meter.

The scale on the kilovoltmeter is calibrated to read correctly at from 0 to 5 MA. When operating

above 5 MA., the operator must make allowances for the drop in kilovoltage in the transformer. This decrease in kilovoltage drop does not show on the meter. The rule for determining the kilovoltage is as follows:

FOR EACH 5 MA. ABOVE 5 MA., SUBTRACT 2.5 KVP. FROM THE READING ON THE METER.

For example: If when the X-ray button is pushed the milliammeter reads 10 MA. and the kilovoltmeter reads 75 KVP., this would mean (using the above rule) that the actual kilovoltage was 72.5 KVP.

Another example is obtaining readings of 20 MA. and 60 KVP. with "X-rays on". The milliamperage is 15 greater than the 5 for which the meter is calibrated, so the actual kilovoltage would be: $60 - 3 \times 2.5$ or 52.5 kilovolts.

WARNING: Do NOT make adjustments of kilovoltage with the kilovoltage control while the machine is producing X-rays.

A tubehead rating chart is supplied with each unit. It should be consulted before making exposures so that the capacity of the tube is not exceeded. The purpose of the chart is to determine the maximum time that the tube can be operated continuously at a desired milliamperage and kilovoltage. If this chart is disregarded, there is danger of overheating and melting the target.

WARNING: Do not go over 20 MA. if the tubehead is a type GR-A which is made for use at 60 cycles. Do not exceed 15 MA. if the tubehead is a type GR-K which is made for use on 50 cycle.

The heat generated at the target will travel through the copper anode of the tube then into the oil in the head and eventually it will pass into the air from the tubehead. The heating of the oil causes it to expand. The expansion is taken up by a rubber bellows inside the tubehead. However, if the oil becomes too warm, the bellows will reach the limit of its expansion and pressure can build up in the head to a point that will cause it to leak.

In order to be sure that the bellows will not reach the limit of its movement, the tubehead must not be operated at individual exposures with such frequency that the heat will exceed 90,000 heat units in a half-hour period.

Heat units are defined as the product of kilovoltage, milliamperes, and the time in seconds—the three factors determining the heat generated. An example is as follows:

An exposure at 70 KVP. and 10 MA. for one minute generates $70 \times 10 \times 60 = 42{,}000$ heat units. Two such exposures could be made in half hour with a safety factor.

20-80 Operation Procedure

1. Plug timer into receptacle on face of control if radiography is to be done, or plug footswitch in for fluoroscopy.
2. Set kilovoltage control knob so that the kilovolt meter reads approximately the kilovoltage called for in the technique charts for the technique desired. (Do not adjust this knob while the machine is producing X-rays—that is, while either the footswitch or timer is being operated.)
3. Press either the footswitch or timer and set the machine for the milliamperage called for in the technique chart for the technique desired, then release the timer or footswitch.
4. Operate the machine again while watching the kilovolt meter and observe the reading. This reading is the actual kilovoltage if you are using 5 MA. or less. If you are operating over 5 MA., subtract 5 kilovolts for each additional 10 milliamperes over 5 MA. That is, for 10 MA., subtract 2½ KVP.; for 15 MA. subtract 5 KVP.; and for 20 MA., subtract 7½ KVP. This will be the actual kilovoltage at these various milliamperages.

   For example: If the reading on the meter when the timer is operated is 70 KVP., and the milliammeter reads 15 MA., the actual kilovoltage is 65 KVP. If the technique chart calls for a higher or lower kilovoltage, re-adjust the kilovoltage with the kilovoltage control knob but do not do the adjusting while the machine is producing X-rays.

   The kilovoltage is adjusted in steps so it will not always be possible to obtain the exact kilovoltage called for. In this case, it is generally best to use the kilovoltage setting that is on the high side of desired kilovoltage.
5. The technique charts give information about positioning the patient. The only other requirement for the machine is setting the timer. Set for the time called for in the technique chart. If you accidentally set the timer for a longer time, the timer setting knob can be moved back to the desired time. Always press the timer button quickly to the limit of its movement.

TEN-STATE NUTRITION SURVEY
DENTAL EXAMINATION

It is very important that all information be properly entered on the dental examination by circling the proper symbols. Failure to circle the appropriate symbol or number may result in deletion of data from the analysis.

All examination procedures should be followed consistently, and all portions of the form should be completed according to the instructions.

This manual describes the codes for each of the items appearing on the dental examination form.

Item 1. Identification Code

Before proceeding to the clinical examination, check all parts of the Identification Code under Item 1 to be certain that all of the information is entered. Missing information may be obtained from other examination forms used in the survey. When a patient does not know the full name of his dentist, obtain the last name and the city where the dentist is located.

In the last portion of Item 1 beside Column (21), four choices appear. One of the first two choices is scored if the participant is not examined and one of the last two choices is scored if the participant is examined. Number 1 (No show) is scored if a participant arrives at the Examination Center but does not appear at the Dental Examination Station. Number 2 of Column (21) is scored if a participant openly refuses to submit to the Dental Examination.

If either number 1 or 2 of Column (21) is scored, the remainder of the Dental Examination Form is left unscored.

Number 3 of Column (21) is scored if the participant has at least one tooth or even a root tip present upon examination. If number 3 is scored, the remainder of the Dental Examination Form is completed starting with Item 2.

Number 4 of Column (21) is scored if the participant is completely edentulous, irrespective of age. If number 4 is scored, only the portion of the examination form starting with Item 8 is completed.

Item 2. Teeth

Regardless of age, a clinical examination is attempted on all participants. The code for the symbols found in Item 2 is as follows:

U = *Unerupted* tooth.

N = *Normal.* A tooth is scored as normal when no caries or fillings are present.

D1 = *D1* is scored if caries is present and the tooth can be restored properly by involving only one surface.

D2 = *D2* is scored if caries is present and proper restoration of the tooth requires the involvement of two or more surfaces.

F = A *filled* tooth with no decay.

MO = A *missing* tooth with no replacement.

MR = A missing tooth that has been *replaced* with a fixed or removable appliance.

X = A tooth requiring *extraction* from caries. A tooth with an obvious pulp involvement or a crown completely destroyed by decay with only the roots remaining would be scored as X.

A tooth is considered erupted when it or any portion of it is visible.

A tooth is considered carious when the enamel yields to underlying soft material with the explorer tip. This applies to both virgin decay and recurrent decay around the margins of an old restoration.

In all persons under fifteen years circle "yes" or "no" to indicate whether the tooth is or is not a primary tooth. When a primary tooth and a permanent tooth are visible in a tooth space, the permanent tooth is scored in Item 2 and the primary tooth is counted as an extraction in Item 13. When a primary tooth is missing and the child is past the eruption date of the tooth, the space is scored as permanent, unerupted tooth (e.g. No—U).

Supernumerary teeth are disregarded for Items 2 and 3. They are scored as 77 under Item 19.

When a U or MO or MR is scored in Item 2, the corresponding column number in Item 3 is automatically scored as NC without exception.

If a participant is edentulous in only *one* arch, the corresponding portion of Item 2 is scored as either MO or MR. The participant who is edentulous in one arch and without a complete denture is scored MO. If the same participant had a complete denture present in the edentulous arch, the appropriate arch of Item 2 would be scored as MR with the exception of the third molars which would be scored as MO. When a participant is scored as edentulous in one arch in Item 2 ,the corresponding portion of Item 3 is automatically scored as NC.

Item 3. Gingiva

The gingiva is scored according to the Periodontal Index (P.I.) of Russell. All tooth

spaces having a tooth present are scored with a numerical value with the following exceptions: (1) a tooth space without its natural tooth, (2) a tooth space with only its root tip remaining. These exceptions are scored as NC in Item 3. Several of these exceptions are quickly detected in Item 2. For example, all of the tooth spaces scored as U, MO, and MR in Item 2 are automatically scored as NC in Item 3. The X's of Item 2 indicating only root tips remaining are also scored NC in Item 3. The criteria for the P.I. are as follows:

0 = *Negative.* There is neither overt inflammation in the investing tissues nor loss of function produced by destruction of supporting tissues.

1 = *Mild Gingivitis.* There is an overt area of inflammation in the free gingivae, but this area does not circumscribe the tooth.

2 = *Gingivitis.* Inflammation completely circumscribes the tooth, but there is no apparent break in the epithelial attachment.

6 = *Gingivitis with Formation of Pockets.* The epithelial attachment has been broken and there is a pocket (not merely a deepened gingival crevice due to swelling in the free gingivae). There is no interference with normal masticatory function, the tooth is firm in its socket, and has not drifted.

8 = *Advanced Destruction with loss of Masticatory Function.* The tooth may be loose; may have drifted; may sound dull on percussion with a metallic instrument; may be depressible in its socket.

When in doubt, always assign the lesser score.

Item 4. Oral Hygiene

The oral hygiene of each participant is evaluated by the Oral Hygiene Index—Simplified (OHI-S) of Greene and Vermillion. The criteria for the OHI-S are as follows:

Debris

0 = No debris or stain present

1 = Soft debris covering not more than one third of the tooth surface being examined or the presence of extrinsic stains without debris regardless of surface area covered.

2 = Soft debris covering more than one third but not more than two thirds of the exposed tooth surface.

3 = Soft debris covering more than two thirds of the exposed tooth surface.

Calculus

0 = No calculus present.

1 = Supragingival calculus covering not more than one third of the exposed tooth surface being examined.

2 = Supragingival calculus covering more than one third but not more than two thirds of the exposed tooth surface, or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth.

3 = Supragingival calculus covering more than two thirds of the exposed tooth surface or a continuous heavy band of subgingival calculus round the cervical portion of the tooth.

When in doubt, give the lesser score.

Only six tooth surfaces are scored for the OHI-S: four posterior and two anterior. In the posterior portion of a permanent dentition, the first fully erupted tooth distal to the second bicuspid, normally the first molar, is scored. In the posterior portion of a primary dentition, the most distal fully erupted premolar is scored. In a mixed dentition, the permanent tooth takes precedence over the primary tooth and the tooth selection proceeds according to the description given under the permanent dentition. The teeth selected for scoring in the anterior portion of the mouth are the upper right central incisor and the lower left central incisor. In the absence of either of these anterior teeth, the central incisor on the opposite side of the midline is substituted.

The surfaces examined are the buccal surfaces of the selected upper molars, the lingual surfaces of the selected lower molars, and the labial surfaces of the upper right and lower left central incisors.

For the OHI-S each tooth surface, buccal or lingual, is considered to encompass half of the circumference of the tooth. For example, the buccal surface of the molar includes half of the mesial and half of the distal surfaces.

A tooth is considered fully erupted when the occlusal or incisal surface has reached the occlusal plane. Surfaces with full veneer crowns and surfaces reduced in height by caries or trauma are not scored. Under these circumstances, an alternate tooth is selected for scoring. If a suitable alternate tooth is not present, the appropriate portion of the arch is scored NC (Not Classified).

Teeth with orthodontic bands are also scored as NC.

Item 5. Opacities

Opacities are defined as opaque areas in the enamel and are divided into those caused by fluoride and those from other causes.

Fluorosis is scored according to the criteria developed by Dean and is applied to the two most severely affected teeth. The criteria for Dean's Classification is as follows:

0 = *None or Normal.* The enamel presents the usual translucent, semi-vitriform type of structure. The surface is smooth, glossy, and usually of a pale creamy white color.

1 = *Questionable.* The enamel discloses slight aberrations from the translucency of normal enamel, ranging from a few white flecks to occasional white spots. This classification is utilized in those instances where a definite diagnosis of the mildest form of fluorosis is not warranted and a classification of normal not justified.

2 = *Very Mild.* Small, opaque, paper white areas scattered irregularly over the tooth but not involving as much as approximately 25 percent of the tooth surface. Frequently included in this classification are teeth showing no more than about 1-2 mm. of white opacity at the tip of the summit of the cusps of the bicuspids or second molars.

3 = *Mild.* The white opaque areas in the enamel of the teeth are more extensive but do not involve as much as 50 percent of the tooth surface.

4 = *Moderate.* All enamel surfaces of the teeth are affected, and surfaces subject to attrition show marked wear. Brown stain is frequently a disfiguring feature.

5 = *Severe.* All enamel surfaces are affected and hypoplasia is so marked that the general form of the tooth may be affected. The major diagnostic sign of this classification is the discrete or confluent pitting. Brown stains are widespread and teeth often present a corroded-like appearance.

9 = *Not Classified.* NC means that the teeth were not examined for fluoride opacities. (e.g.—orthodontic bands prevent adequate examination.)

The examination of the teeth for nonfluoride opacities is limited to the upper six anterior permanent teeth. At least two teeth of the selected teeth must be present to receive a score. The score is based on the two most severely affected teeth.

Nonfluoride opacities are often round or oval. They are clearly differentiated from the adjacent normal enamel and they are usually pigmented, often creamy yellow to dark orange. They may not follow a systematic pattern of distribution.

The following criteria are used for scoring the nonfluoride opacities:

0 = *None or Normal.* The enamel presents the usual translucent, semi-vitriform type of structure. The surface is smooth, glossy and usually of a pale creamy white color.

3 = *Mild.* The opaque area covers less than one-half of one or both of the two labial surfaces most affected.

4 = *Moderate.* The opaque area covers at least one-half but less than the complete labial surface of each of the two teeth most severely affected.

5 = *Severe.* The opaque area involves one complete tooth surface and more than one-half of the other tooth surface.

9 = *Not classified.* NC means that the teeth were not examined for nonfluoride opacities or that not enough eligible teeth were present because of orthodontic bands or labial restorations that involved the middle third of the surface.

If any doubt exists about the degree of opacity, always choose the lesser score.

Item 6. Orthodontic Appliances Present

For this examination an orthodontic appliance is either a fixed or a removable appliance used to move the teeth or to retain those that have been moved. A space maintainer is not included in this definition.

Item 7. Partial Dentures Present

For this examination a partial denture is a fixed or removable prosthetic appliance, including a fixed or removable space maintainer.

Item 8. Trouble Biting or Chewing

All participants 10 years of age and older, regardless of their dental condition, are asked whether they have trouble biting or chewing. The question is asked to find out what people perceive of their general ability to bite or chew while eating. The question may be phrased as follows: "Do

you have any trouble biting or chewing when you eat?" If the answer is "No" circle "1 (None." If an edentulous participant, either with or without dentures, answers "No," pursue the questioning by asking if they have any difficulty biting or chewing apples or corn on the cob or meat. If the participant acknowledges difficulty eating such foods as apples and corn on the cob, score "2 (Sel)" indicating trouble with selected foods. If the participant indicates difficulty eating meat unless it is cut into small pieces or ground up, score "3 (Firm)" which is the symbol for trouble with firm foods. If the participant has difficulty when eating all foods and uses only a semi-solid or soft diet, score "4 (All)", which indicates trouble with all foods. Children less than 10 years of age are automatically scored as "9 (Under 10)."

Item 9. Edentulous Arches

Items 9 and 10 are closely related and are intended for the participants with one or both arches edentulous. "No" or "1" is the symbol for not edentulous, in column numbers (39) and (40) of Item 9. A "1 (No)" is scored if only one tooth is present in an arch. "NC" or "9" is the symbol for "does not apply" in Item 9, columns (41) and (42).

For an edentulous participant with complete dentures present at the time of examination, the "2 (Pres)" is scored for each arch and the "9 (NC)" is circled in column numbers (41) and (42) of Item 9.

In addition to simply examining edentulous participants with complete dentures, the examiner subjectively evaluates the adequacy of all complete dentures. Any denture which has produced an obvious hypertrophy of the palatal and/or alveolar mucosa or has caused marked articulation, should be scored as "4 (Def)" in the first portion of Item 9. This symbol is for a defective denture. The denture is judged only on the effect on the underlying structures and not on its articulation or stability. If the edentulous person has dentures with him, but is not wearing them at the time of the examination, score them as "4 (Def)."

If a participant is edentulous and dentures are absent at the time of examination, the "3 (Abs)" is scored for the appropriate arch or arches of Item 9. The participant is asked "Have you ever had dentures?" and "Do you now have dentures?" If the participant had an upper denture at one time, the "1 (U)" or symbol for upper denture is circled. The "2 (L)" is the symbol for the lower denture. If the same participant stated they "Never had any dentures," "4 (No)," the symbol for never had dentures, is circled.

Item 10. If Subject has Dentures

In addition to the questions asked in the previous item, the participant with complete dentures is asked how many years they have had their present set of dentures. Their answer is scored in numbers which symbolize intervals of years. For example, a participant has a defective upper and lower denture and has had it for 25 years. This answer would be scored as "5 (20+)," which is the symbol for 20 plus years, in column number (43) and (44).

Participants who are edentulous and without artificial dentures are asked: "How many years have you been without teeth?" Their answer is scored using the same symbols as in the previous question.

The fewer number of years is scored when the participant indicates some doubt.

The "9 (NC)" is the symbol for does not apply, which is the case for all dentulous patients.

Item 11. Prosthetic Appliances Needed

If, in the subjective opinion of the dental examiner, the participant being examined does not need a fixed or removable appliance, the "3 (None)" is scored for both arches in Item 11. Fixed and removable partial dentures and removable space maintainers are scored as "2 (Part)." When a space maintainer is indicated, an additional note is included under Item 23.

Item 12. Number of Tooth Spaces Needing Replacements

The number of tooth spaces needing replacement is the number of tooth spaces that should be replaced in the opinion of the dental examiner. Third molars are not included. If no prosthetic appliances are needed in Item 11, Item 12 is scored as "0 0." If two full dentures were indicated in Item 11, the number "28" should be entered in Item 12.

Item 13. Total Number of Extractions Needed

The score for Item 13 is the total number of primary and permanent extractions needed, regardless of the reason for the extractions. This total may or may not be the same as the number of "X's" in Item 2.

Item 14. Periodontal Treatment Recommended

On the basis of the brief clinical examination, the dental examiner must decide whether in his

judgment the participant requires periodontal treatment, and, if so, to what degree. The symbols for recommendation of periodontal treatment are as follows:

0 = *None.* No obvious periodontal pathology is present and no treatment is recommended.

1 = *Minimum.* The initial stages of gingival inflammation are present and not more than one appointment is recommended. (This category includes the simple prophylaxis.)

2 = *Moderate.* Enough periodontal pathology is present to require more than one appointment, but not more than two appointments to treat properly. (This category may include deep scaling and curettage requiring more than one but not more than two sittings.)

3 = *Extensive.* The periodontal pathology is extensive enough to require three or more appointments to treat properly.

Item 15. Emergency Treatment Needed

For this examination emergency treatment is indicated for the following conditions: (1) the relief of pain, (2) the elimination of acute infection, (3) the control of bleeding, and (4) the decision to obtain a biopsy of a suspicious lesion. The presence of any of the above conditions would be scored as "1 (Yes")" in Item 15; the absence of these conditions would be scored as "2 (No)."

Because it is not in the purview of this survey to administer treatment services, any condition which the dental examiner diagnoses as needing critical treatment should be to the participants' dentist.

Item 16. Number of Years Since Last Dental Visit

Each participant 10 years or older is asked how long it has been since their last dental visit. In asking this question of children it is helpful to ask the question in this manner: "Did you go to the dentist before school started this year, or did you go last year?" It is important to use the term dentist in the question because children may frequently misinterpret the question to mean an examination at school by a dental hygienist. If the child is hesitant to respond, refer the question to the child's parent if available.

When asking the question of an adult, it usually expedites matters to prompt them with intervals of years. For example, ask an adult: "How many years has it been since your last dental examination—one or two or five years?"

The code for the numerical values found in *Item 16* is:

1 = *01* years since last dental visit

2 = *2-4* years since last dental visit

3 = *5-9* years since last dental visit

4 = *10 years or more* since last dental visit

5 = *Never* gone to a dentist

9 = *UNK.* Participant does not know date of last dental visit

Item 17. Lips

The lips of each participant are examined closely starting at the vermillion borders and slowly turning the lips outward, with the mirror, until the labio-muco fold is clearly visible. Lesions at the angles of the lips, characterized by fissures, dryness, cracking, and burning are recorded as number "1 (LES)." Scars from healed angular lesions are recorded as "2" and the number "3" is circled when both are present.

The code for the numerical values found in Item 17 is:

ANGLES

1 = *LES.* A lesion is present at one or both angles (or corners) of the mouth.

2 = *SCARS.* Scaring is present at one or both angles of the mouth.

3 = *BOTH.* Both a lesion and a scar are present at one or both angles of the mouth.

4 = *NO.* Neither a lesion or scar are present at one or both angles of the mouth.

CHEILOSIS is a condition of the vermillion surface of the lips characterized by fissures, dry-scaling, and painful cracks.

1 = *U.* Cheilosis is present on the upper lip.

2 = *L.* Cheilosis is present on the lower lip.

3 = *BOTH.* Cheilosis is present on both lips.

4 = *NO.* Cheilosis is not present on either lip.

Item 18. Clefts

Each participant, regardless of age, if examined for the presence or absence of clefts of the lip or palate. The adequacy of treatment, if attempted, of any clefts is evaluated by the dental examiner according to esthetics for the clefts of lips, the degree of closure, and quality of speech for the clefts of the palate.

The code for the numerical values found in Item 18 is:

CLEFT LIP, UNILATERAL and CLEFT LIP, BILATERAL

0 = *NO.* No cleft is present.

1 = *GOOD.* Surgical treatment of the cleft appears good.

2 = *FAIR.* Surgical treatment of the cleft appears fair.

3 = *POOR.* Surgical treatment of the cleft appears poor.

4 = *INC.* Surgical treatment of the cleft appears incomplete.

5 = *NONE.* Surgical treatment of the cleft was not attempted.

CLEFT PALATE

0 = *NO.* No cleft is present.

1 — *GOOD.* Surgical treatment has resulted in a good closure of the cleft and a good quality of speech.

2 = *FAIR.* Surgical treatment has resulted in a fair closure of the cleft and/or a fair quality of speech.

3 = *POOR.* Surgical treatment has resulted in a poor closure of the cleft and/or a poor quality of speech.

4 = *INC.* Surgical treatment has resulted in an incomplete closure of the cleft.

5 = *NONE.* Surgical treatment of the cleft was not attempted.

BIFID UVULA

0 = *NO.* No bifid uvula is present.

1 = *PRESENT.* A bifid uvula is present. Any depression or notch on the uvula which gives the appearance of a bifrication is scored as "1." If the examiner has any doubt concerning the presence of a bifid uvula, score column (61) "0."

Item 19. Other Pathology

Any lesion noted during the soft tissue examination of the oral cavity should be scored according to one or more of the numerical values which appears under Item 19. The soft tissue examination should include palpation of the floor of the mouth, the submaxillary and supracervical lymph nodes, the parotid glands, and the roof of the mouth.

If a circumstance arises that requires more than three of the codes listed 50 through 60, the 77 is scored as the third choice which may include several conditions. If for example a participant presents the following conditions: packydema oris, several hepetic ulcers, a geographic tongue, and mandibular tori, Item 19 would be scored as "50," "53" and "77," with an explanation of the geographic tongue and mandibula tori given under REMARKS.

Item 20. Examiner No.

The dental examiner number should be written as assigned, using two digits. The first dental examiner, for example, would be written as "01."

Item 21. Recorder No.

The dental recorder number should be written as assigned, using two digits. The tenth dental recorder, for example, would be written as 10.

Item 22. Dental Examination

When all items of the dental examination form are successfully completed, the "1" of Item 22 is circled. If for any reason one of the items is not legitimately completed, the "2 (Incomplete)" of Item 22 is scored. If for example a child becomes uncooperative after the examination was started or a participant with denture refused to remove their dentures for the soft tissue examination, the "2 (Incomplete)" would be scored.

Each item which is not legitimately completed should be scored according to the following code:

Item 2 = Circle all of the zeros starting with Column Number (22) in which a "0" is written.

Item 3 = Circle all of the "NC's" starting with Column Number (22).

Item 4 = Circle all of the "NC's" starting with Column Number (22).

Item 5 = Circle both of the "9's" present.

Item 6 = Write a "9" in the space beside 2 (No.).

Item 7 = Write a "9" in the space beside 2 (No.).

Item 8 = Write a "0" in the space beside 1 (None) for a participant over ten years of age. The 9 (and 10) is still scored for child under ten years of age.

Item 9 = Write a "9" in the space beside each 4 (Def) and circle the remaining 9's.

Item 10 = Circle all of the "9's" present.

Item 11 = Write a "9" in the space beside each 3 (None).

Item 12 = Write a "99" in the boxes provided.

Item 13 = Write a "99" in the boxes provided.

Item 14 = Write a "9" in the space beside the 3 (Ext).

Item 15 = Writ ea "9" in the space beside the 2 (No.).

Item 16 = Write a "0" in the space beside 1 (0-1) unless the information to score 5 (Never) is obtained.

Item 17 = Write a "9" in the space beside each 4 (No.).

Item 18 = Write a "9" between each "0" (No) and 1 (Good/Present).

Item 10 = Write a "99" under the six zeroes (None).

Item 20 & 21 = Both are always completed.

Item 22 = The "2 (Incomplete)" is circled.

Item 23 = The "1 (Yes)" should be circled with an explanation for the incomplete examination given under REMARKS.

Item 23. Remarks

If the dental examiner desires to comment on any of the items appearing on the examination form, the "1 (Yes)" is scored under Item 23 and the comment is written in the adjacent section entitled REMARKS. When no comment is made about any of the items appearing on the examination form, the "2 (No)" is scored under Item 23.

APPENDIX II

HISTORICAL DEVELOPMENT OF THE TEN-STATE NUTRITION SURVEY 1968-1970

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Dr. Ogden C. Johnson
Dr. Arnold E. Schaefer

APPENDIX III

HISTORICAL DEVELOPMENT OF THE TEN-STATE NUTRITION SURVEY 1968-1970

SURVEY FORMS

I.

NATIONAL NUTRITION SURVEY
HOUSEHOLD INFORMATION

Budget Bureau No. 68-S68029
Approval expires June 30, 1970

A. Identification Codes Start Card 1:

State (1-2) | County (3-5) | E.D. (6-7)

Household No. (8-9) | Family (10) | (11-12) 8 8 | Dietary Code (13)

B. Address *(House No., P.O. Box No., Street, City or Town, County, State)*

C. No. of individuals in household
Unrelated (21-22) | Related (23-24)

D. Type of place *(Determine whether urban or rural and enter code number in box)* (25)

1—Inside city limits (2,500 population or more) or built-up suburb—Urban
2—Not inside such limits—property contains ten or more acres and product sales totaled $50 or more last year—Rural farm
3—Property contains under ten acres and product sales totaled $250. or more last year—Rural farm
4—All other places—Rural non-farm

E. Is public sewer or water present in the road serving this dwelling? (26)

1—Both sewer and water
2—Sewer only
3—Water only
4—Neither

F. Does this housing unit have water piped in? (27)

1—Cold water only
2—Hot and cold water
3—Neither

G. What is the total number of rooms? (Not counting baths or unlived-in attic or cellar) (28-29)

H. How many rooms are used regularly for sleeping? (30-31)

I. What is usual language spoken by adults in the home? (32)

1—English
2—Spanish
3—French
4—American Indian
5—Italian
6—Other *(Specify)* _____

J. How long has head of household lived within 50 miles of this place? (Code number of years) (33-34)

K. At age 16, did head live in: (35)

1—Large city (over 50,000)
2—Small town or city
3—The country

L. At age 16 where did head live? (36-37)

Specify State or territory _____

If foreign country *(specify)* _____ (38)

M. Respondent's line No. (73-74)

N. Completion code (75)

0—Completed
1—Refused
2—Not available
3—Informant incapable
4—Other
5—Moved

O. Interviewer No. (76-77)

Card No. 1 (78-80) 0 1 1

P. Control

1. Name of interviewer

2. Date of visit

3. Dates other calls were made:

DATES	RESULTS

4. Available phone number ☐ None

5. Where is phone? ☐ Respondent's home ☐ Home of neighbor

6. Description of housing unit (Identifying features to be used only to assist in locating dwelling for revisit. Leave blank if not needed)

CONFIDENTIAL—All information which would permit identification of an individual or of an establishment will be held confidential, will be used only by persons engaged in and for the purpose of the Survey, and will be protected against disclosure in accordance with provisions of 42 CFR Part 1.

NCCD-3-1 (D.C.)
REV. 3-69
PAGE—1

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

Q. Family and relatives living in household *(Code unrelated and related persons in cols. 21–24 on page 1.)*
(If any individuals or separate families are living here who are *not* relatives, enter the total number of such persons in the code box (21–22; code 00 if none) and fill out a separate interview schedule for each unrelated individual and each separate family. (See the definitions on right.) Enter number, address, etc., for each schedule the same as this, but enter a consecutive family number for each new schedule.)

Start Card No. 3—Repeat Cols. 1–10. One card for each subject.

1. SUBJECT'S LINE NO.	2. Last and first name of related residents (Include those absent only temporarily, but circle line number)		3. DATE OF BIRTH				4. SEX
			DIETARY CODE	MONTH	DAY	YEAR	Code: 1—Male 2—Female
(11–12)	LAST NAME	FIRST NAME	(13)	(14–15)	(16–17)	(18–19)	(20)
01							
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							

Comments:

Definitions: **Family**— A group of persons related by blood, marriage, or adoption who regularly live together in the same housing unit.

Unrelated individual— A person who lives alone, or lives with others to whom he is not related.

Work experience—Full year, 40 weeks or more; Part year, under 40 weeks. Full-time, 35 hours or more, weekly; part-time, under 35 hours weekly. If two or more part-time jobs average out over the year at 35 hours or more per week, the person should be entered as working full-time. Military service is work, so is unpaid family labor in a family business. Housework in the home is labor, but is not counted as work experience.

5. MARITAL STATUS Code: 1—Married 2—Widowed 3—Divorced 4—Separated 5—Never married	6. RACE (Code in Column 40) 1—Caucasian 2—American Indian 3—Negro 4—Oriental Ethnic group (Code in column 41) 1—Spanish-American 2—Other *(Specify)* _____ _____ 8—Not applicable	7. RELATION TO FAMILY HEAD Code: 1—Head 2—Spouse 3—Child 4—Stepchild 5—Parent 6—Others 7—Married Child	8. NOW IN SCHOOL Code: 0—No 1—Yes 2—Day nursery	9. HIGHEST GRADE COMPLETED TO DATE Code: (44-45) 00—No Schooling 01-12—Grades 21-29—After High School but not college 31-34—College 41-49—Post-grad. in college 50—Other 88—Infant	10. WORK EXPERIENCE LAST YEAR (Omit persons under 12) A. Person worked: Code: 0—None 1—Full year, Full-time 2—Full year, Part-time 3—Part year, Part-time 4—Part year, Full-time 5—Under 12 B. Major reason for not working full year, full-time Code: 1—Ill or disabled 2—Pregnant 3—Keeping house 4—Going to school 5—No work available 6—Retired 7—Other (under 12) 8—Not applicable (Working full-year, full-time)	11. Any relative who lives here now, but did not live here during at least 6 months of last year? Reason: 1—Returned from college or other institution 2—Returned from military 3—Married into family 4—Needed support or housing 5—Broken, separate home due to divorce, death, etc. 6—Other reason 8—Not applicable

(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)	LINE NO.
										01
										02
										03
										04
										05
										06
										07
										08
										09
										10
										11
										12
										13
										14
										15
										16

Date of examination (69-74) *Month* *Day* *Year*

Completion code (75)

Interviewer No. (76-77)

Card No. 3 (78-80) 0 1 3

NCCD-3-1 (D.C.)
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Start Card Number 2 (Repeat Cols. 1–13 from Card 1)

R. Are there any relatives who do not live here now, but did live here at least six months of last year? (code 8 or more persons as code 8)

NO. OF PERSONS	(22)	(24)	(26)
REASON	(23)	(25)	(27)

Reason:
1—Went to college or other institution
2—Went into military
3—Married away from family
4—Started own household, not married
5—Divorced or separated
6—Died
7—Other
8—Not applicable

Home Interviewer skips to Item U. below, if so instructed

S. Was income received last month (last year) by any member of the household (listed on page 2 for Item Q.) from any of the following: *(Obtained later—if so instructed—by another interviewer in the examination center.)*

Code: 0—No 1—Yes

	Last Month		Last Year	
1. Unemployment insurance	$	(28)	$	(29)
2. Public pension, social security, etc.	$	(30)	$	(31)
3. Private pension	$	(32)	$	(33)
4. Aid to dependent children	$	(34)	$	(35)
5. Other regular public welfare payment	$	(36)	$	(37)
6. Alimony or child support	$	(38)	$	(39)
7. Armed Forces allotment	$	(40)	$	(41)
8. Other sources *(Interest, dividends, real estate; and investments—exclude one-time cash payments, such as insurance compensation, prizes, sales of property)*	$	(42)	$	(43)
TOTAL	$		$	

T. Can you recall about how much the total income of all persons in your family (household) put together amounted to for last month (last year). *(Round to nearest 100 dollars for last year; to nearest 10 dollars for last month)*

Source	Last month	Last year
1. From wages and salaries		
2. From own business or self-employment		
a. Farm income		
b. Non-farm income		
3. Total income		
4. Total income from item S. *(all additional sources)*		
5. Grand total *(Items 3 and 4)* Code direct to nearest $10 and $100.	To Nearest $10 (44)(45)(46)(47) 0	To Nearest $100 (48)(49)(50)(51)(52) 0 0

U. Do none, some or all of this family travel seasonally in search of work such as harvesting fruit, vegetables, or grain crops or other seasonal labor? *(This refers to migrant workers)* (53)

0—None 1—Some 2—All 9—Unknown

V. Is the home: *(Enter number in code box)* (54)

1—Owned or being bought? 2—Rented, private ownership? 3—Rented, public housing? 4—Rent free, as pay? 5—Rent, free as gift? 9—Unknown

W. Which group would you say your family fits into most nearly of the ones shown on this card? (55–56)
(Interviewer shows "flash card" to respondent during home visit)

Completion code (75)
0—Completed 1—Refused 2—Not available 3—Informant incapable 4—Other 5—Moved

Interviewer No. (76–77)

Card No. 2 (78–80) 0 1 2

NCCD–3–1 (D.C.)
REV. 3–69

PAGE—4

II. NATIONAL NUTRITION SURVEY
Pediatric Clinical History
(Children under 6 years of age)

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. IDENTIFICATION CODE
State (1-2) | County (3-5) | E.D. (6-7)
Household No. (8-9) | Family (10) | Line No. (11-12)
Dietary (13) | Date of Birth (14-19): Month Day Year | Sex (20)

B. INFORMANT'S NAME | **C. RELATIONSHIP**

D. INDIVIDUAL'S NAME

E. CLINICAL HISTORY Code direct items 1–5, 8, and 17–19; codes indicated for other columns

1. Birth weight (lbs.) (21-22) (oz.) (23-24)

2. Birth order (25-26)

3. At what age did child sit alone? (Months) (27-28)
77—Not yet

4. At what age did child walk alone? (Months) (29-30)
77—Not yet

5. At what age did child say words like "mama"? (Months) (31-32)
77—Not yet

6. Was child fed solely from bottle?
0—No
1—Yes
(33)

7. If child was bottle fed, was milk:
1—Whole cow's
2—Commercial formula
3—Soybase
4—Meat base
5—Other (specify)_____
8—Not applicable
(34)

8. If not bottle fed at what age was child weaned? (Months) (35-36)
77—Not yet

9. Does child receive supplemental vitamins?
0—No
1—Yes
(37)

10. Does or did child have congenital defects involving:
0—None
1—Heart
2—Mouth
3—Eyes
4—Feet
5—G.U. system
6—Mental defic.
7—Cerebral palsy
8—Other or combination
(38)

11. Has child had any of the following contagious diseases?
codes: 0—No 1—Yes
a. Measles
b. Chicken pox
c. Mumps
(39-41) (a) (b) (c)

12. Has child received any of the following immunizations? codes:
0—No
1—Mass campaign
2—H.D. clinic
3—Private physician
4—Other (specify)_____
a. DPT
b. Polio
c. Smallpox
d. Measles
e. Mumps
(42-46) (a) (b) (c) (d) (e)

13. Does child pass worms? code:
0—No
1—Tiny white
2—Pencil like
3—Other
(47)

14. Does child eat any of these? (PICA)
0—None
1—Dirt or clay
2—Starch
3—Paint
4—Other
5—Combination
(48)

15. Has child ever accidentally ingested medicine or poison?
0—No
1—Yes
(49)

16. Has child ever had serious accident resulting in physical injury? codes:
0—None
1—Burn
2—Auto
3—Fall
4—Flying object
5—Suffocation
6—Other or combination
(50)

17. How many colds has child had during past 6 months?
0—None
(code direct, 8 or more as 8)
(51)

18. How many times in his life has he had pneumonia?
0—None
(code direct, 8 or more as 8)
(52)

19. How many times has child had diarrhea during past 6 months?
0—None
(code direct, 8 or more as 8)
(53)

20. Does he have diarrhea now?
0—No
1—Yes
(54)

21. Major operations code:
0—No
1—Yes, specify_____
(55)

22. Significant illness other than above
0—No
1—Yes, specify_____
(56)

23. Date of Examination (69-74) Month Day Year

24. Completion code
0—Completed
1—Refusal
2—Not available
3—Informant incapable
4—Other
(75)

25. Interviewer's name
Code No. (76-77)

26. Card number (78-80) 0 2 1

NCCD-3-2 (D.C.)
REV. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

GPO : 1969 OF—337-824

III

NATIONAL NUTRITION SURVEY
PEDIATRIC CLINICAL EXAMINATION
(Children under 6 years of age)

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. Identification code

State (1-2) | County (3-5) | E.D. (6-7)

Household No. (8-9) | Family (10) | Line No. (11-12)

Dietary (13) | Date of Birth (14-19): Month, Day, Year | Sex (20)

B. Name *(First, middle, last)*

C. GENERAL EXAMINATION—Code: 0–Negative; 1–Positive, unless other positive codes are designated; 8–Not applicable

	Examination	Doubtful	Col. No.	Code
1. HAIR — All Neg. ☐	a. Dry staring		(21)	
	b. Dyspigmented		(22)	
	c. Easily Pluckable		(23)	
	d. Abnormal texture or loss of curl		(24)	
2. EYES — All Neg. ☐	a. Circumcorneal injection, bilateral		(25)	
	b. Conjunctival injection, bilateral		(26)	
	c. Xerosis conjunctivae		(27)	
	d. Bitot's spots		(28)	
	e. Keratomalacia		(29)	
	f. Xerophthalmia		(30)	
3. LIPS — All Neg. ☐	a. 1—Angular lesions 2—Angular scars 3—Both		(31)	
	b. Cheilosis		(32)	
4. TEETH — All Neg. ☐	a. Visible caries 4+		(33)	
	b. 1—Debris 2—Calculus, 3—Both		(34)	
	c. Fluorosis		(35)	
5. GUMS — All Neg. ☐	a. Marginal redness or swelling 1—Local 2—Diffuse		(36)	
	b. Swollen red papillae, 1—Local 2—Diffuse		(37)	
	c. Bleeding gums 1—Local 2—Diffuse		(38)	
6. TONGUE — All Neg. ☐	a. Filiform papillary atrophy 1—Mild 2—Moderate 3—Severe		(39)	
	b. Fungiform papillary hypertrophy or hyperemia 1—Mild 2—Moderate 3—Severe		(40)	
	c. Geographic		(41)	
	d. Fissures		(42)	
	e. Serrations or swellings		(43)	
	f. Red edges		(44)	
	g. Scarlet Beefy (Glossitis)		(45)	
	h. Magenta		(46)	
7. FACE AND NECK — All Neg. ☐	a. Nasalabial Seborrhea		(47)	
	b. Parotids visibly enlarged		(48)	
	c. Thyroid enlarged 0, 1, 2, 3		(49)	
8. FINGERS AND NAILS — Neg. ☐	1—Clubbed 2—Spooned 3—Ridged 4—Combinations		(50)	
9. SKIN — All Neg. ☐	a. Follicular Hyperkeratosis, Arms		(51)	
	b. Follicular Hyperkeratosis, Back		(52)	
	c. Dry or scaling (Xerosis)		(53)	
	d. Hyperpigmentation, Face and hands		(54)	
	e. Thickened Pressure Points		(55)	

NCCD-3-3 (D.C.)
REV. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

C. GENERAL EXAMINATION—continued

Examination		Doubtful	Col. No.	Code
10. ABDOMEN All Neg. ☐	a. Pot belly		(56)	
	b. Hepatomegaly		(57)	
11. LOWER EXTREMITIES Neg. ☐	a. Pretibial Edema-Bilateral		(58)	
12. SKELETAL All Neg. ☐	a. Beading of ribs		(59)	
	b. Bowed legs		(60)	
12. SKELETAL (Continued) All Neg. ☐	c. Epiphyseal Enlargement, wrists		(61)	
	d. Bossing of skull		(62)	
	e. Winged scapula		(63)	
13. IMPRESSIONS All Neg. ☐	1—Skinny 2—Fat 3—Neither		(64)	
	1—Apathetic 2—Irritable 3—Both		(65)	

D. Date of Examination (69–74)

Month ☐☐ Day ☐☐ Year ☐☐

E. Completion code (75) ☐

0—Completed
1—Refusal
2—Not available
3—Informant incapable
4—Other

F. Examiner's name (76–77)

Code No. ☐☐

G. Card number (78–80) 0 3 1

Comments:

U.S. GOVERNMENT PRINTING OFFICE : 1969 O—337-825

IV.

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

NATIONAL NUTRITION SURVEY
CLINICAL HISTORY

Adults and children 6 years of age and over

A. Identification code

State (1-2) | County (3-5) | E.D. (6-7)

Household No. (8-9) | Family (10) | Line No. (11-12)

Date of birth (14-19): Month | Day | Year

Dietary (13) | Sex (20)

B. Informant's name

C. Relationship

D. Individual's name

E. GENERAL MEDICAL HISTORY (All individuals 6 years of age and over)
Codes: 0— None; 1—Now or during past year; 2—Over one year ago; 8—Not applicable

Condition	Treatment Col.	Treatment Code	Hospitalized Col.	Hospitalized Code
1. Anemia	(21)		(22)	
2. Abnormal bleeding	(23)		(24)	
3. Asthma	(25)		(26)	
4. Hay Fever	(27)		(28)	
5. Other allergy	(29)		(30)	
6. Tuberculosis	(31)		(32)	
7. Other chronic respiratory disease	(33)		(34)	
8. Thyroid disease or goiter	(35)		(36)	
9. Diabetes	(37)		(38)	
10. Obesity	(39)		(40)	
11. Epilepsy	(41)		(42)	
12. Mental illness	(43)		(44)	
13. Hemorrhoids	(45)		(46)	
14. Hernia	(47)		(48)	

END CARD NUMBER 1 (78-80) 0 4 1

START CARD NUMBER 2 (Repeat cols. 1—20 from card 1)

Condition	Treatment Col.	Treatment Code	Hospitalized Col.	Hospitalized Code
15. Peptic ulcer	(21)		(22)	
16. Gall bladder disease	(23)		(24)	
17. Liver disease	(25)		(26)	
18. Prostate disease	(27)		(28)	
19. Kidney stones	(29)		(30)	
20. Kidney or bladder infection	(31)		(32)	
21. Rheumatic fever	(33)		(34)	
22. High blood pressure	(35)		(36)	
23. Heart disease	(37)		(38)	
24. Stroke	(39)		(40)	
25. Arthritis or rheumatism	(41)		(42)	
26. Fractures	(43)		(44)	
27. Malignancy	(45)		(46)	

F. OTHER HISTORY (All individuals 6 years of age and over) Code: 0—No; 1—Yes—Give details in "comments"; 8—Not appl.

1. Major operations in past? (47)
2. Activity restricted by any chronic condition? (48)
3. Unable to work because of any chronic condition? (49)

Card number 2 (78-80) 0 4 2

G. REPRODUCTION HISTORY—Females 10 years and over—Start card No. 3 (Repeat Cols. 1-20 from card 2)

1. Age at menarche? (21-22)
2. Menarche reliability? (23)
3. Are you pregnant? (24)
   0—No 1—Yes 9—Don't know
3a. If "Yes," to question 3 is this the first or second half of gestation? (25)
   1—First half 2—Second half 8—Not applicable
3b. Are you lactating? (26)
   0—No 1—Yes

NCCD-3-4 (D.C.)
REV. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

G. REPRODUCTION HISTORY—Females 10 years and over—Continued

4. Number past pregnancies? (27–28)	5. Number of live born now living? (29–30)	6. Number of live born now dead? (31–32)	7. Number of miscarriages? (33)
8. Number of stillborns? (34)	9. Sets of twins? (35)	10. Sets of triplets? (36)	11. Age first pregnancy ended? (37–38)
12. Age most recent pregnancy ended? (39–40)	13. Pregnancy history reliability (41)	14. Age at menopause? (42–43)	15. Menopause reliability (44)

H. LIVEBORN CHILDREN NOW LIVING (By present age)

1. Age < 1 month (45)	2. 1 month to 1 year (46)	3. 1 year to 5 years (47)	4. 5 years and over (48–49)

I. LIVEBORN CHILDREN NOW DEAD (By age at death)

1. Age < 1 month (50)	2. 1 month to 1 year (51)	3. 1 year to 5 years (52)	4. 5 years and over (53)

J. Date of examination (69–74)

Month Day Year

K. Completion code (75)

0—Completed
1—Refusal
2—Not available
3—Informant incapable
4—Other

L. Examiner's name

Code No. (76–77)

M. Card number 3 (78–80)

0 4 3

N. Comments:

U.S. GOVERNMENT PRINTING OFFICE : 1969 O—337-826

V.

NATIONAL NUTRITION SURVEY
GENERAL CLINICAL EXAMINATION
(Adults and children 6 years of age and over)

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. Identification code

State (1-2) | County (3-5) | E.D. (6-7)

Household No. (8-9) | Family (10) | Line No. (11-12)

Date of birth (14-19): Month | Day | Year

Dietary (13) | Sex (20)

B. Name

C. GENERAL EXAMINATION—Code: 0—Negative; 1—Positive, unless other positive codes are designated; 8—Not appl.

	Examination	Doubtful	Col. No.	Code
1. HAIR Neg. ☐	a. Dry, staring		(21)	
2. EYES All Neg. ☐	a. Thickened opaque bulbar conjunctivae		(22)	
	b. Angular lesions of eyelids		(23)	
	c. Circumcorneal injection, bilateral		(24)	
	d. Conjunctival injection, bilateral		(25)	
	e. Xerosis conjunctivae		(26)	
	f. Bitot's spots		(27)	
	g. Xerophthalmia		(28)	
3. LIPS All Neg. ☐	a. 1—Angular lesions 2—Angular scars 3—Both		(29)	
	b. Cheilosis		(30)	
4. TEETH All Neg. ☐	a. 1—Edent. 3—Both 2—Plates 8—Has teeth		(31)	
	b. Visible caries, 4+		(32)	
	c. 1—Debris 2—Calculus 3—Both		(33)	
	d. Fluorosis		(34)	
5. GUMS All Neg. ☐	a. Atrophy, recession, inflammation 1—Local 2—Diffuse		(35)	
	b. Marginal redness or swelling 1—Local 2—Diffuse		(36)	
	c. Swollen red papillae 1—Local 2—Diffuse		(37)	
	d. Bleeding gums 1—Local 2—Diffuse		(38)	
6. TONGUE All Neg. ☐	a. Filiform papillary atrophy 1—Mild 2—Moderate 3—Severe		(39)	
	b. Fungiform papillary hypertrophy 1—Mild 2—Moderate 3—Severe		(40)	
	c. Geographic		(41)	
	d. Fissures		(42)	
	e. Serrations or swellings		(43)	
	f. Red edges		(44)	
	g. Scarlet beefy *(Glossitis)*		(45)	
	h. Magenta		(46)	
7. FACE AND NECK All Neg. ☐	a. Malar pigmentation		(47)	
	b. Nasolabial seborrhea		(48)	
	c. Parotids visibly enlarged		(49)	
	d. Thyroid enlarged 0, 1, 2, 3		(50)	
8. FINGERS AND NAILS Neg. ☐	1—Clubbed 2—Spooned 3—Ridged 4—Combinations		(51)	

END CARD NUMBER 1 (78-80) | 0 | 5 | 1

START CARD NO. 2 (Repeat Cols. 1-20 from card 1)

	Examination	Doubtful	Col. No.	Code
9. SKIN All Neg. ☐	a. Follicular hyperkeratosis, arms		(21)	
	b. Follicular hyperkeratosis, back		(22)	
	c. Dry or scaling *(Xerosis)*		(23)	

NCCD-3-5 (D.C.)
REV. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

C. GENERAL EXAMINATION—Continued

	Examination	Doubtful	Col. No.	Code
9. SKIN *(Continued)*	d. Hyperpigmentation face or hands		(24)	
	e. Thickened pressure points, not elbow or knee		(25)	
	f. Perifolliculosis		(26)	
All Neg. ☐	g. Purpura or petechiae		(27)	
	h. Crackled skin *(mosaic)*		(28)	
	i. Loss of elasticity		(29)	
	j. Pellagrous dermatitis *(comments)*		(30)	
10. ABDOMEN Neg. ☐	a. Hepatomegaly		(31)	

	Examination	Doubtful	Col. No.	Code
11. LOWER EXTREMITIES	a. Calf tenderness		(32)	
	b. Pretibial edema, bilateral		(33)	
All Neg. ☐	c. Absent knee jerk, bilateral		(34)	
	d. Absent ankle jerk, bilateral		(35)	
	c. Absent vibratory sense, ankle		(36)	
12. SCROTUM Neg. ☐	a. Scrotal dermatitis (8—Not applicable)		(37)	

13. Pulse *(code direct)* (38–40) ☐☐☐

14. Blood pressure *(code direct)* (mm Hg) Systolic (41–43) ☐☐☐ Diastolic (44–46) ☐☐☐

D. Date of examination (69–74)

Month ☐☐ Day ☐☐ Year ☐☐

E. Completion code (75) ☐

0—Completed
1—Refusal
2—Not available
3—Informant incapable
4—Other

F. Examiner's name

Code No. (76–77) ☐☐

G. Card number 2 (78–80) 0 5 2

H. Comments

U.S. GOVERNMENT PRINTING OFFICE : 1968 OP—337-827

VI.

NATIONAL NUTRITION SURVEY
Clinical Examination—Anthropometry

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. Identification Codes

State (1-2) | County (3-5) | E.D. (6-7)

Household No. (8-9) | Family (10) | Line No. (11-12)

Date of Birth (14-19): Month | Day | Year

Dietary (13) | Sex (20)

B. Name

C. MEASUREMENTS FOR ALL SUBJECTS—Code Direct

1. Weight *(Kg. to nearest tenth)* (21-24)	2. Clothing estimate *(Kg. to nearest tenth)* (25-26)	3. Nude weight *(Kg. to nearest tenth)* (27-30)	4. Height *(mm)* (31-34)
5. Knee Height *(mm)* (35-37)	6. Bicondylar diameter femur *(mm)* *(Knee)* (38-40)	7. Bistyloid diameter *(mm)* *(Wrist)* (41-42)	8. Biacromial diameter *(mm)* *(Shoulder)* (43-45)
9. Calf circumference *(mm)* (46-48)	10. Arm circumference *(mm)* (49-51)	11. Subscapular skinfold *(mm)* (52-53)	12. Triceps skinfold *(mm)* (54-55)

D. Measurement for Children Under 6 Years of Age—Code Direct

1. Chest circumference *(mm)* (56-58)
   888—Not applicable

2. Head circumference *(mm)* (59-61)
   888—Not applicable

E. Recorder's Name

F. Standardization check (67)
1—Original measurements
2—Duplicate measurements

G. Weight recorded as: (68)
1—Kgs.
2—Lbs.

H. Date of Examination (69-74)
Month | Day | Year

I. Completion code (75)
0—Completed
1—Refusal
2—Not available
3—Informant incapable
4—Other

J. Examiner's Name (76-77)
Code No.

K. Card Number (78-80)
0 6 1

L. Comments:

NCCD-3-6 (D.C.)
REV. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

U.S. GOVERNMENT PRINTING OFFICE : 1969 O—337-822

VII

NATIONAL NUTRITION SURVEY

LABORATORY RECORD

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. IDENTIFICATION CODES

State (1–2) | County (3–5) | E. D. (6–7) | Household No. (8–9) | Family (10) | Line No. (11–12) | Dietary (13) | Date of birth (14–19) Mo. Day Year | Sex (20) | Lab. No. (21–25)

Item	Col. No.	Code
1. WHOLE BLOOD		
a. Hemoglobin *(gm/100 ml)*	(26–28)	
b. Hematocrit (%)	(29–30)	
c. Red cell riboflavin *(mcg/100 ml)*	(31–33)	
d. Whole blood folate *(mmcg/ml)*	(34–36)	
e. Red cell folate *(mmcg/ml)*	(37–39)	
2. SERUM		
a. Folates *(mmcg/ml)*	(40–42)	
b. Serum iron *(mcg/100 ml)*	(43–45)	
c. Serum iron binding capacity *(mcg/100 ml)*	(46–48)	
d. Vitamin A *(plasma)* *(mcg/100 ml)*	(49–51)	
e. Carotene *(plasma)* *(mcg/100 ml)*	(52–54)	
f. Vitamin C *(mg/100 ml)*	(55–57)	
g. Cholesterol *(mg/100 ml)*	(58–60)	
Date of examination (69–74) Mo. Day Year		
CARD NUMBER 1	(78–80)	0 7 1
Start card 2 (Repeat cols. 1–25)		

Item	Col. No.	Code
h. Total Protein *(gm/100 ml)*	(26–28)	
i. Albumin *(gm/100 ml)*	(29–31)	
j. Alpha 1 globulin *(gm/100 ml)*	(32–34)	
k. Alpha 2 globulin *(gm/100 ml)*	(35–37)	
l. Beta globulin *(gm/100 ml)*	(38–40)	
m. Gamma globulin *(gm/100 ml)*	(41–43)	
n. Total globulin *(gm/100 ml)*	(44–46)	
CARD NUMBER 2	(78–80)	0 7 2
Start card 3 (Repeat cols. 1–25)		
3. URINE		
a. Time of collection 1—A.M. 2—P.M.	(26)	
b. Creatinine *(mg/100 ml)*	(27–30)	
c. Riboflavin *(mcg/gm creatinine)*	(31–34)	
d. Thiamine *(mcg/gm creatinine)*	(35–38)	
e. Urea nitrogen *(gm/gm creatinine)*	(39–41)	
f. Iodine *(mcg/gm creatinine)*	(42–44)	
g. Glucose *(strip test)*	(45)	
h. Albumin *(strip test)*	(46)	

Item	Col. No.	Code
4. ANTHROPOMETRY		
a. Height *(mm)*	(47–50)	
b. Weight *(kg.)*	(51–54)	
5. Other tests *(specify)*		
a.	(55–58)	
b.	(59–62)	
c.	(63–66)	
d.	(67–70)	
CARD NUMBER 3	(78–80)	0 7 3
Start card 4 (Repeat cols. 1–25)		
6. Other Determinations		
a. Plasma urea nitrogen *(mg/100 ml)*	(26–27)	
b. Plasma riboflavin *(mcg/100 ml)*	(28–31)	
c. Urine creatinine *(mg/gm creatinine)*	(32–34)	
d. Plasma amino acid ratio	(35–36)	
e. Urinary hydroxy-proline *(mg/day)*	(37–38)	
f. Urinary hydroxy-proline index	(39–40)	
g. Transketolase *(% augmentation by TPP)*	(41–42)	
h. Total urinary nitrogen *(gm/gm creatinine)*	(43–44)	
i. Serum B_{12} *(pg/ml)*	(45–48)	
CARD NUMBER 4	(78–80)	0 7 4

NCCD-3-7 (D.C.)
REV. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

U.S. GOVERNMENT PRINTING OFFICE : 1969 OF—337-823

VIII.

NATIONAL NUTRITION SURVEY

DIETARY—Household Roster

LAST NAME

ADDRESS (Street, City, State, ZIP Code)

Budget Bureau No. 68-S68029
Approval expires June 30, 1970

A. IDENTIFICATION—Start card number 1

State (1-2) | County (3-5) | E.D. (6-7)

Household (8-9) | Family (10) | Subject's line No. (11-12) — 0 1

Dietary Code (13) | Respondent's line No. (14-15) | Date of examination (16-21): Mo. Day Year

(Repeat columns 1-10 and 14-21 from subject 01)

Sex Code (column 28)
1—Male
2—Female, not pregnant
3—1st pregnant
4—2nd pregnant
5—Lactating
6—1 Lactating and pregnant
7—2 Lactating and pregnant

Meals Eaten Code (col. 33-36)
0—Ate from home source
1—Ate from other source
2—Did not eat
3—Does not know

Meal Pattern Code (col. 37)
0—None
1—All meals
2—Only a.m.
3—Only noon
4—Only evening
5—a.m. and noon
6—a.m. and evening
7—Noon and evening

Special Diet Code (col. 38)
0—None
1—Diabetes
2—Caloric restriction
3—Na. restriction, pregnant
4—Na. restriction, other
5—Other

Reliability of Height and Weight Code (col. 49)
1—Both actual
2—Weight estimated
3—Height estimated
4—Both estimated

Completion Code (col. 75)
0—Completed
1—Refusal
2—Not available
3—Informant incapable
4—Other

SUBJECT'S Line No.	Last and first name of residents plus yesterday's guests for meals: LAST NAME	FIRST NAME	DIETARY CODE	DATE OF BIRTH: Month	Day	Year	SEX AND PREGNANCY STATUS (Code)	MEALS EATEN YESTERDAY (Code): A.M.	NOON	P.M.	BETWEEN MEALS	USUAL HOME MEAL PATTERN (Code)	SPECIAL DIET: SPECIAL DIET (Code)	DOCTOR PRESCRIPTION (1—No 2—Yes 8—Not appl.)	ANTHROPOMETRY: UNITS 1—kgs. 2—lbs.	WEIGHT	HEIGHT (mm)	HEIGHT AND WEIGHT RELIABILITY	Line No.
(11-12)			(13)	22-23	(24-25)	(26-27)	(28)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41-44)	(45-48)	(49)	
01																			01
02																			02
03																			03
04																			04
05																			05
06																			06
07																			07
08																			08
09																			09
10																			10
11																			11
12																			12
13																			13
14																			14
15																			15
16																			16

Comments:

Completion code (75)

Interviewer's name and number (76-77)

Card Number 1 (78-80) — 0 8 1

NCCD-3-8 (D.C.)
REV. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAMS
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

U.S. GOVERNMENT PRINTING OFFICE 1969 O—339-467

VIII.A.

NATIONAL NUTRITION SURVEY

DIETARY—Household—General Information

LAST NAME

ADDRESS *(Street, City, State, ZIP Code)*

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. IDENTIFICATION CODE: (Start Card No. 3)

State (1-2)	County (3-5)	E D (6-7)	Household No. (8-9)	Family (10)	Line No. (11-12)	Dietary (13)	Respondent's line No. (14-15)	Date of Interview (16-21) Mo.	Day	Year
					8 8					

B. GENERAL INFORMATION

1. I would like to know the usual source of your family's food. (Record 1 if applicable, 0 if not) Is it:
   - a. Purchased (22)
   - b. Commodities (23)
   - c. Home produced (24)
   - d. Hunting and fishing (25)
   - e. Gifts (26)
   - f. Payment for work (27)

2. If you produced any food last year estimate how much your family consumed (Record 0000 if none produced)
   - a. Beef No. of pounds (28-31)
   - b. Pork, No. of pounds (32-35)
   - c. Poultry, No. of pounds (36-39)
   - d. Other animal protein, No. of pounds (40-41)
   - e. Milk, gallon/day (42-43)
   - f. Eggs, dozen/week (44-45)

If you preserved food (can, freeze, dry, etc.) from home produced
- g. Fruit, No. of quarts (46-48)
- h. Vegetables, No. of quarts (49-51)

3. Where do you usually buy your food and how do you pay for it? (Use code 1 if source not used)
   - a. Supermarket (52)
   - b. Farm store (53)
   - c. Neighborhood store (54)
   - d. Other (55)

   1—No 2—Cash 3—Credit 4—Cash and credit

4. (For use of interviewer only) Which food programs are available in this area? (56)
   0—None 1—Stamps 2—Commodities 3—Both

5. Are you now getting surplus foods? (57)
   1—No 2—Regularly 3—Occasionally 8—Not applicable

   If no: Did you ever? (58)
   1—No 2—Yes 8—Not applicable

6. Do you now purchase food stamps (59)
   1—No 2—Regularly 3—Occasionally 8—Not applicable

   If not now, did you ever? (60)
   1—No 2—Yes 8—Not applicable

7. How much do you pay for them monthly? (Enter to nearest dollar) (61-63)
   000—Not purchased 888—Not applicable $

8. What is their value? (Enter to nearest dollar) (64-66)
   888—Not applicable

9. Why is respondent not getting stamps or commodities although available? (67)
   1—No need, or disinterest 2—Classified as not eligible 3—Respondent does not think eligible 4—Did not know about stamps 5—Cannot afford 6—Needs transportation 7—Other reasons 8—Not appl. 9—Unknown

Completion code (75)

CARD NUMBER 3 (78-80) 0 8 3

BEGIN CARD 4. Repeat Cols. 1-21 from Card 3:

10. How much did you spend last month for your family food? (Include value of food stamps if used) (Enter to nearest dollar) (22-24)
    999—Don't know
    Work space _____

11. Was this the amount you usually spend? (25)
    1—No 2—Yes 8—Not applicable

12. Do you have adequate kitchen facilities?
    - a. Respondent's attitude regarding storage. (26)
      1—Adequate 2—Not adequate
    - b. Respondent's attitude regarding burners (27)
      1—Adequate 2—Not adequate
    - c. Oven (28)
      0—None 1—Functions (Work) 2—Does not function (Work)
    - d. Refrigeration (Respondent's answer) (29)
      1—Adequate 2—Not adequate
    - e. Kind of refrigeration (30)
      0—None 1—Ice 2—Automatic 3—Home freezer 4—Use comm. freezer 5—Auto. comb. R/F 6—Comb. of any units above

13. Do you share cooking facilities? (31)
    1—No 2—Yes

14. Do you share refrigerator? (32)
    1—No 2—Yes

15. Do you share storage facilities? (33)
    1—No 2—Yes

Completion code (75)

Interviewer's number (76-77)

CARD NUMBER 4 (78-80) 0 8 4

Remarks:

Completion code (Col. 75)
0—Completed 1—Refused 2—Not available 3—Informant incapable 4—Other

NCCD-3-8a (D.C.)
(Rev. 3-69)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA

GPO 1969 O-339-699

VIII. B.

NATIONAL NUTRITION SURVEY

DIETARY—24 Hour Recall—Household

LAST NAME

ADDRESS *(Street, City, State, ZIP Code)*

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. IDENTIFICATION (Start card No. 2)

State (1-2)	County (3-5)	E.D. (6-7)	Household (8-9)	Family (10)	Subject line No. (11-12)	Dietary code (13)	Respondent's line No. (14-15)	Date of Recall Mo. / Day / Year (16-21)
					8 8			

C. FOOD ITEMS (Punch a new card for each food code. Repeat cols. 1-21 for each card)

INGESTION PERIOD	FOOD CODES					FOODS AND BEVERAGES CONSUMED		WORK AREA FOR COMPUTATION	SIZE OF EDIBLE PORTION SERVED			TIME OF DAY
									I	II	III	
(24)	(25)	(26)	(27)	(28)	(29)	FOOD ITEM	DESCRIPTION		(30-34)	(35-39)	(40-44)	

Ingestion Period Code *(Column 24)*
1—a.m.
2—Noon lunch
3—Between meals
4—p.m.
5—School lunch
9—Total day

Completion Code *(Column 75)*
0—Completed
1—Refused
2—Not available
3—Informant incapable
4—Other

Day of week of recall (74)

Completion code (75)

Interviewer's Name and Number (76-77)

Card Number 3 (78-80): 0 8 3

NCCD-3-88 (D.C.)
REV. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

U.S. GOVERNMENT PRINTING OFFICE 1968 O—339-139
662-842

IX. NATIONAL NUTRITION SURVEY
DIETARY—24 Hour Recall—Aging (60 and older)

NAME *(Last, first, initial)*

ADDRESS *(Street, City, State, ZIP Code)*

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. IDENTIFICATION (Start Card No. 1)

State (1-2)	County (3-5)	E. D. (6-7)	Household (8-9)	Family (10)	Subject's line No. (11-12)	Dietary Code (13)	Respondent's line No. (14-15)	Date of recall (16-21) Mo. Day Year	Date of birth (22-27) Mo. Day Year	Sex (28)
										1—Male 2—Female

B. GENERAL INFORMATION

1. Who usually prepares your food? (29)
1—Spouse 3—Other household member
2—Self 4—Other

2. Do you now purchase food stamps? (30)
1—No 3—Occasionally 8—Not applicable
2—Regularly 4—Not certified

3. What are the major ways your food is paid for? (31-33)
(Do not enter more than three)
1—Self income (include Social Security) 5—Other
2—Home produced 6—Welfare donated food
3—Welfare check 7—Food Stamps
4—Family 8—Not applicable

4. Do you have income of your own? (34)
1—No
2—Yes

5. Do you generally eat with others of the family? (35)
1—No 8—Not applicable
2—Yes

Completion code (75)

Card number 1 (78-80) 0 9 1

C. FOOD ITEMS (Start Card Number 2. Repeat cols. 1-21 from Card Number 1. Punch a new card for each food code.)

INGESTION PERIOD (24)	FOOD CODES (25) (26) (27) (28) (29)	FOODS AND BEVERAGES CONSUMED: FOOD ITEM	FOODS AND BEVERAGES CONSUMED: DESCRIPTION	WORK AREA FOR COMPUTATION	SIZE OF EDIBLE PORTION SERVED I (30-34)	II (35-39)	III (40-44)	TIME OF DAY

Ingestion Period Code *(Column 24)*
1—a.m. 3—Between meals 5—School lunch
2—Noon lunch 4—p.m. 9—Total day

Completion code *(Column 75)*
0—Completed 2—Not available 4—Other
1—Refused 3—Informant incapable

Day of week of recall (74)

Completion code (75)

Interviewer's Name and Number (76-77)

Card Number 2 (78-80) 0 9 2

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE

DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

U.S. GOVERNMENT PRINTING OFFICE : 1969 O—339-133
88 2- 8 37

X. NATIONAL NUTRITION SURVEY

DIETARY—24 Hour Recall—Preg/Lact Females

NAME *(Last, first, initial)*

ADDRESS *(Street, City, State, ZIP Code)*

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. IDENTIFICATION (Start Card No. 1)

State (1-2)	County (3-5)	E. D. (6-7)	Household (8-9)	Family (10)	Subject's Line No. (11-12)	Dietary Code (13)	Respondent's Line No. (14-15)	Date of Recall (16-21) Mo. Day Year	Date of Birth (22-27) Mo. Day Year	Pregnancy Status (28)

Pregnancy Status: 3—PG 1° 4—PG 2° 5—Lactating 6—Lact/PG 1° 7—Lact/PG 2°

B. GENERAL INFORMATION

1. Have you made any changes in what you eat or drink because you are pregnant? (29)
   1—No 2—Yes

2. How did you know to make these changes? (30)
   1—Doctor or clinic 5—Other
   2—Family member 8—Not applicable
   3—Friend or neighbor
   4—Self imposed

3. Are you taking any vitamin/mineral supplements? (31)
   1—No 3—Minerals
   2—Vitamins 4—Both

4. Are you taking any calcium or iron supplements? (32)
   1—No 3—Iron
   2—Calcium 4—Both

5. Did the doctor tell you to take these supplements? (33)
   1—No 4—Minerals
   2—Both 8—Not applicable
   3—Vitamins

6. Are you eating anything such as (34)
   1—No 5—Paper
   2—Starch 6—Other and combinations
   3—Dirt 8—Not applicable
   4—Clay

Completion code (75)

Card number 1 (78-80) 1 0 1

C. FOOD ITEMS (Start card Number 2. Repeat columns 1-21 from card Number 1. Punch a new card for each food code).

INGESTION PERIOD	FOOD CODES					FOODS AND BEVERAGES CONSUMED		WORK AREA FOR COMPUTATION	SIZE OF EDIBLE PORTION SERVED			TIME OF DAY
									I	II	III	
(24)	(25)	(26)	(27)	(28)	(29)	FOOD ITEM	DESCRIPTION		(30-34)	(35-39)	(40-44)	

Ingestion Period Code *(Column 24)*
1—a.m. 3—Between meals 5—School lunch
2—Noon lunch 4—p.m. 9—Total day

Completion code *(Column 75)*
0—Completed 2—Not available 4—Other
1—Refused 3—Informant incapable

Day of week of Recall (74)

Completion code (75)

Interviewer's Name and Number (76-77)

Card Number 2 (78-80) 1 0 2

NCCD-3-10 (D.C.)
REV. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

U.S. GOVERNMENT PRINTING OFFICE : 1969 O—339-156

XI.

NATIONAL NUTRITION SURVEY

DIETARY — Frequency (Household)

LAST NAME

ADDRESS *(Street, City, State, ZIP Code)*

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. IDENTIFICATION (Start Card Number 1)

State (1-2)	County (3-5)	E. D. (6-7)	Household (8-9)	Family (10)	Subject's Line No. (11-12)	Dietary code (13)	Respondent's Line No. (14-15)	Date of Interview (16-21) Mo.	Day	Year
					8 8					

B. How many times do you usually serve these foods to your family? As I read a food, tell me how many times a day, week, or month you serve it.

	No. of Times	Interval (24) D1 W2 M3 Y4
1. Milk (Beverage and cereals)		
a. Whole fresh	(22-23)	
b. Fresh skim or buttermilk	(25-26)	(27) D1 W2 M3 Y4
c. Evaporated (whole or skim)	(28-29)	(30) D1 W2 M3 Y4
d. Dry skim	(31-32)	(33) D1 W2 M3 Y4
2. Poultry	(34-35)	(36) D1 W2 M3 Y4
3. Fish	(37-38)	(39) D1 W2 M3 Y4
4. Mixed meat, fish poultry (Dishes, casseroles, stews, etc.)	(40-41)	(42) D1 W2 M3 Y4
5. Meat (Includes franks, luncheon meat, etc.)	(43-44)	(45) D1 W2 M3 Y4
6. Eggs	(46-47)	(48) D1 W2 M3 Y4

	No. of Times	Interval (51) D1 W2 M3 Y4
7. Cheese and cheese dishes	(49-50)	
8. Soups	(52-53)	(54) D1 W2 M3 Y4
9. Mature or dry peas and beans (Include nuts and peanut butter)	(55-56)	(57) D1 W2 M3 Y4
10. Cereals and grain products (Bread, rice, pasta, etc.)	(58-59)	(60) D1 W2 M3 Y4
11. a. Fruits and Vegetables rich in Vitamin C *(see guidelines)*	(61-62)	(63) D1 W2 M3 Y4
b. Vegetables rich in Vitamin A *(see guidelines)*	(64-65)	(66) D1 W2 M3 Y4
12. Other fruits and vegetables	(67-68)	(69) D1 W2 M3 Y4
Card Number 1		(78-80) 1 1 1
Begin Card No. 2 (Repeat Cols. 1-21 from card 1)		

	No. of Times	Interval (24) D1 W2 M3 Y4
13. Pastries and other desserts, (Including custards, ice cream, sherbets, etc.)	(22-23)	
14. Jams, jellies, candies	(25-26)	(27) D1 W2 M3 Y4
15. Beverages *(see guidelines)* a. Sweetened beverages	(28-29)	(30) D1 W2 M3 Y4
b. Artificially sweetened beverages	(31-32)	(33) D1 W2 M3 Y4
c. Coffee or tea	(34-35)	(36) D1 W2 M3 Y4
d. Beer	(37-38)	(39) D1 W2 M3 Y4
e. Wine	(40-41)	(42) D1 W2 M3 Y4
f. Whiskey, gin, vodka, rum	(43-44)	(45) D1 W2 M3 Y4
16. Snack foods *(chips, corn chips, etc.)*	(46-47)	(48) D1 W2 M3 Y4

17. How many of your family usually eat together at:

a. The A.M. meal (49) — 1—All 2—None 3—Some

b. Noon meal (50) — 1—All 2—None 3—Some

c. P.M. meal (51) — 1—All 2—None 3—Some

18. How many of your household members usually eat one or more meals out? *(use actual number)*

a. Each day (52-53)

b. 2-3 times a week (54-55)

c. 4-5 times a week (56-57)

AT OFFICE: FROM FORM VIII.

Total number of persons in household (58-59)

Completion code (75)

Interviewer's number (76-77)

Card number 2 (78-80) 1 2

No. of Times code: 00—None; 99—Unknown

Interval code: D1—Daily W2—Weekly M3—Monthly Y4—Yearly

Completion code: 0—Completed 1—Refused 2—Not available 3—Informant incapable 4—Other

NCCD-3-11 (D.C.)
REV. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA, 22203

U.S. GOVERNMENT PRINTING OFFICE: 1969 O—339-687

XII.

NATIONAL NUTRITION SURVEY

DIETARY—24 Hour Recall—Adolescents

NAME

ADDRESS (*Street, City, State, ZIP Code*)

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. IDENTIFICATION (Start Card No. 1)

State (1-2) | County (3-5) | E.D. (6-7) | Household (8-9) | Family (10) | Subject's line No. (11-12) | Dietary Code (13) | Respondent's line No. (14-15) | Date of recall (16-21): Mo. / Day / Year

Date of birth (22-27): Mo. / Day / Year

Sex and pregnancy status (28)
1—Male; 2—Female; 3—Pregnant 1*; 4—Pregnant 2*; 5—Lactating; 6—Lactating and pregnant 1*; 7—Lactating and pregnant 2*

B. GENERAL INFORMATION (continue Card No. 1)

Do you usually attend school when it is in session? (29)
1—No 2—Yes

2. Is there a lunch program in your school? If "yes,"—Do you usually eat there three or more times weekly during school session? (30)
1—No program; 2—Lunch program; doesn't eat; 3—Lunch program; eats; 8—Not applicable

3. Are you currently employed? (See guidelines) If "yes,"—Is your employment full or part-time? (Full-time = 35 hrs. week +) (31)
1—No; 2—Employed full-time; 3—Employed part-time

4. Is what you ate yesterday the way you usually eat? (32)
1—Yes; 2—No; Respondent ill; 3—No; Respondent had no money; 4—No; other reasons; 8—Not applicable

5. Are you eating anything, such as (33)
1—No; 2—Starch; 3—Dirt; 4—Clay; 5—Paper; 6—Other and combinations

6. Do you take vitamin or mineral supplements? (34)
1—No; 2—Vitamins; 3—Minerals; 4—Both

7. Are you taking calcium or iron supplements? (35)
1—No; 2—Calcium; 3—Iron; 4—Both

8. Did the doctor tell you to take them? (36)
1—No; 2—Both; 3—Vitamin; 4—Minerals; 8—Not applicable

Complete if pregnant

9. Have you made any changes in what you eat or drink because you are pregnant? (37)
1—No; 2—Yes; 8—Not applicable

10. How did you know to make these changes? (38)
1—Doctor or clinic; 2—Family member; 3—Friend or neighbor; 4—Self-imposed; 5—Other; 6—Not appl.

C. FOOD ITEMS (Start Card 2. Repeat cols. 1-21 from Card No. 1)

INGESTION PERIOD	FOOD CODES					FOODS AND BEVERAGES CONSUMED		WORK AREA FOR COMPUTATIONS (*If needed*)	SIZE OF EDIBLE PORTION SERVED			TIME OF DAY	SOURCE OF FOOD
									I	II	III		
(24)	(25)	(26)	(27)	(28)	(29)	FOOD ITEM	DESCRIPTION		(30-34)	(35-39)	(40-44)		Code (49)
													H SC W P O
													H SC W P O
													H SC W P O
													H SC W P O
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													H SC W P O
													H SC W P O

Day of week of recall (74) | Completion Code (75) | Interviewer's number (76-77) | CARD NUMBER 2 (78-80) 1 2 2

Completion Code (col. 75)
0—Completed; 1—Refusal; 2—Not available; 3—Informant incapable; 4—Other

Source of food Code (col. 49)
1—H—Home; 2—SC—School; 3—W—Worked for food; 4—P—Self purchased; 5—O—Other

Ingestion period Code (col. 24)
1—a.m.; 2—Noon; 3—Between meals; 4—p.m.; 5—School lunch; 9—Total day

Completion code (75)

Interviewer's number (76-77)

CARD NUMBER 1 (78-80) 1 2 1

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

XIII.

NATIONAL NUTRITION SURVEY

DIETARY—24 HOUR RECALL—0–36 MONTHS

NAME

ADDRESS *(Street, City, State, ZIP Code)*

Budget Bureau No. 68-S68029
Approval Expires June 30, 1970

A. IDENTIFICATION (Start Card No. 1)

State (1-2)	County (3-5)	E. D. (6-7)	Household (8-9)	Family (10)	Subject line No. (11-12)	Dietary code (13)	Respondent's line No. (14-15)

Date of recall (16-21): Mo. | Day | Year

Date of birth (22-27): Mo. | Day | Year

Sex (28): 1—Male 2—Female

Ingestion Period (Col. 24): 1—A.M. 2—Noon 3—Between meals 4—P.M. 5—School lunch 9—Total Day

Source of Food code (Col. 49): 1T—Table Food 2H—Home prepared *(Special for baby)* 3B—Baby *(Commercially prepared)* 4J—Junior *(Commercially prepared)*

Completion code (Col. 75): 0—Completion 1—Refusal 2—Not available 3—Informant incapable 4—Other

Day of week of recall (74)

Completion code (75)

Interviewer number (76-77)

CARD No. 2 (78-80): 1 3 2

Part A.

1. Was the milk (he) had yesterday (24 hours) (29-30)
   a. Breast, if "yes,"
      1. Number of times *(00 if "None")*
   2. Was this (31)
      1—Schedule 2—Self demand 8—Not applicable
   b. Bottle, if "yes," (32-33)
      1. Number of times *(00 if "None")*
   2. Was the bottle (34)
      1—Schedule 2—Self demand 8—Not applicable
   3. Was dry skim milk part of donated food? (35)
      (use only if formula had dry skim milk)
      1—Yes 2—No 8—Not applicable

Part B.—Start Card 2. Repeat Cols. 1–21 from Card 1:

INGESTION PERIOD (24)	FOOD ITEM CODE (25-29)	FORMULA ITEM	WORK AREA FOR COMPUTATIONS *(If needed)*	AMOUNT PREPARED I (30-34)	AMOUNT PREPARED II (35-39)	AMT. CONSUMED *(If less than total)* III (40-44)
9	01320	Milk, fresh, whole homog.				
9	01324	Evaporated				
9	01325	Condensed				
9	01327	Dry skim (regular)				
9		Commercial formula				
9		(Brand:)				
9		Water				
9		Total formula volume				
9		Sugar				
9		Syrup-corn type				
9		Other (specify)				

Part C.—What other foods did (name) have yesterday?

INGESTION PERIOD (24)	FOOD CODES (25)(26)(27)(28)(29)	FOOD CONSUMED: FOOD ITEM	FOOD CONSUMED: DESCRIPTION	WORK AREA FOR COMPUTATIONS *(If needed)*	SIZE OF EDIBLE PORTION SERVED I (30-34)	II (35-39)	III (40-44)	TIME OF DAY	SOURCE OF FOOD (49)
									1-T 3-B 2-H 4-J
									1-T 3-B 2-H 4-J
									1-T 3-B 2-H 4-J
									1-T 3-B 2-H 4-J
									1-T 3-B 2-H 4-J
									1-T 3-B 2-H 4-J
									1-T 3-B 2-H 4-J
									1-T 3-B 2-H 4-J

NCCD-3-13 (D.C.)
Rev. 3-69

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
DIVISION OF CHRONIC DISEASE PROGRAMS—NUTRITION PROGRAM
4040 NORTH FAIRFAX DRIVE, ARLINGTON, VIRGINIA 22203

Part C.—Continuation *(If needed)*

INGESTION PERIOD	FOOD CODES					FOOD CONSUMED		WORK AREA FOR COMPUTATIONS	SIZE OF EDIBLE PORTION SERVING			TIME OF DAY	SOURCES OF FOOD
									I	II	III		
(24)	(25)	(26)	(27)	(28)	(29)	FOOD ITEM	DESCRIPTION	*(If needed)*	(30–34)	(35–39)	(40–44)		(49)
													1–T 3–B 2–H 4–J
													1–T 3–B 2–H 4–J
													1–T 3–B 2–H 4–J
													1–T 3–B 2–H 4–J
													7–T 3–B 2–H 4–J
													1–T 3–B 2–H 4–J
													1–T 3–B 2–H 4–J
													1–T 3–B 2–H 4–J
													1–T 3–B 2–H 4–J
													1–A 3–B 2–H 4–J

Part D.—Continued from Part A

1. Is this what (he) usually eats? (36)
   1—Yes; 2—More food; 3—Less: illness; 4—Less: no food available; 5—Less: mother ill; 6—Less: other

2. Is (he) taking vitamins or minerals now? (37)
   1—No; 2—Vitamins; 3—Minerals; 4—Both; 9—Unknown

3. Does (he) usually take these vitamins and/or minerals daily? (38)
   1—No; 2—Yes; 8—Not applicable; 9—Unknown

4. How old was (he) when he started taking these? (Months) (39–40)
   88—Not applicable; 99—Unknown

5. Was (he) ever breast fed? (41)
   1—No; 2—Yes; 9—Unknown

6. If breast fed, at what age were other milks started? (Months) (42–43)
   77—Not yet; 88—Not applicable; 99—unknown

7. At what age was (he) weaned, from the breast? (Months) (44–45)
   77—Not yet; 88—Not applicable; 99—unknown

8. At what age was (he) weaned, from the bottle? (Months) (46–47)
   77—Not yet; 88—Not applicable; 99—unknown

9. At what age were non-milk foods started? (Months) (48–49)
   77—Not yet; 99—unknown

Completion Code (75)

Card Number 1 (78–80) 1 3 1

Remarks

Completion code (col. 75)
0—Completed
1—Refusal
2—Not available
3—Informant incapable
4—Other

Ingestion period code (col. 24)
1—A.M.
2—Noon
3—Between meals
4—P.M.
5—School Lunch
9—Total day

Sources of food code (col. 49)
1—T—Table
2—H—Home prepared (specially for baby)
3—B—Baby, prepared commercially
4—J—Junior, prepared commercially

U.S. GOVERNMENT PRINTING OFFICE 1969 O—339-701

XIV

NATIONAL NUTRITION SURVEY
DENTAL EXAMINATION

1. IDENTIFICATION CODE:

STATE (1-2) | COUNTY (3-5) | E.D. (6-7) | HOUSEHOLD NO. (8-9) | FAMILY (10)

LINE NO. (11-12) | DIETARY (13) | DATE OF BIRTH (14-19): Month / Day / Year | SEX (20)

(21) SUBJECT NOT EXAMINED: NO SHOW = 1, REFUSED = 2 — SUBJECT EXAMINED: HAS TEETH = 3 (GO TO ITEM 2), COMP. EDENT = 4 (GO TO ITEM 8)

SUBJECT'S NAME: (PRINT) LAST (22-35) FIRST (36-47) M.I. (48)

SUBJECT'S DENTIST'S NAME (PRINT) LAST (49-62) FIRST (63-74) M.I. (75)

(78-80) END CARD NO. 1 — 1 4 1

START CARD NO. 2 (REPEAT COLS. 1-21)

2. TEETH - UPPER RIGHT

COL. NO.	PRIMARY TOOTH										UPPER	COL. NO.
(22)			U	N	D1	D2	F	MO	MR	X	M3 [1]	(22)
(23)			U	N	D1	D2	F	MO	MR	X	M2 [2]	(23)
	0	1	2	3	4	5	6	7	8	9		
(24)			U	N	D1	D2	F	MO	MR	X	M1 [3]	(24)
(25-26)	YES	NO	U	N	D1	D2	F	MO	MR	X	B2 [4]	(25)
(27-28)	YES	NO	U	N	D1	D2	F	MO	MR	X	B1 [5]	(26)
(29-30)	YES	NO	U	N	D1	D2	F	MO	MR	X	C [6]	(27)
	0	1	2	3	4	5	6	7	8	9		
(31-32)	YES	NO	U	N	D1	D2	F	MO	MR	X	I1 [7]	(28)
(33-34)	YES	NO	U	N	D1	D2	F	MO	MR	X	C1 [8]	(29)

TEETH - UPPER LEFT

(35-36)	YES	NO	U	N	D1	D2	F	MO	MR	X	C1 [9]	(30)
(37-38)	YES	NO	U	N	D1	D2	F	MO	MR	X	I1 [10]	(31)
(39-40)	YES	NO	U	N	D1	D2	F	MO	MR	X	C [11]	(32)
	0	1	2	3	4	5	6	7	8	9		
(41-42)	YES	NO	U	N	D1	D2	F	MO	MR	X	B1 [12]	(33)
(43-44)	YES	NO	U	N	D1	D2	F	MO	MR	X	B2 [13]	(34)
(45)			U	N	D1	D2	F	MO	MR	X	M1 [14]	(35)
	0	1	2	3	4	5	6	7	8	9		
(46)			U	N	D1	D2	F	MO	MR	X	M2 [15]	(36)
(47)			U	N	D1	D2	F	MO	MR	X	M3 [16]	(37)

(78-80) END CARD NO. 2 — 1 4 2

START CARD NO. 3 (REPEAT COLS. 1-21)

TEETH - LOWER LEFT

											LOWER	
(22)			U	N	D1	D2	F	MO	MR	X	M3 [17]	(38)
(23)			U	N	D1	D2	F	MO	MR	X	M2 [18]	(39)
	0	1	2	3	4	5	6	7	8	9		
(24)			U	N	D1	D2	F	MO	MR	X	M1 [19]	(40)
(25-26)	YES	NO	U	N	D1	D2	F	MO	MR	X	B2 [20]	(41)
(27-28)	YES	NO	U	N	D1	D2	F	MO	MR	X	B1 [21]	(42)
(29-30)	YES	NO	U	N	D1	D2	F	MO	MR	X	C [22]	(43)
	0	1	2	3	4	5	6	7	8	9		
(31-32)	YES	NO	U	N	D1	D2	F	MO	MR	X	I1 [23]	(44)
(33-34)	YES	NO	U	N	D1	D2	F	MO	MR	X	C1 [24]	(45)

TEETH - LOWER RIGHT

(35-36)	YES	NO	U	N	D1	D2	F	MO	MR	X	C1 [25]	(46)
(37-38)	YES	NO	U	N	D1	D2	F	MO	MR	X	I1 [26]	(47)
(39-40)	YES	NO	U	N	D1	D2	F	MO	MR	X	C [27]	(48)
	0	1	2	3	4	5	6	7	8	9		
(41-42)	YES	NO	U	N	D1	D2	F	MO	MR	X	B1 [28]	(49)
(43-44)	YES	NO	U	N	D1	D2	F	MO	MR	X	B2 [29]	(50)
(45)			U	N	D1	D2	F	MO	MR	X	M1 [30]	(51)
	0	1	2	3	4	5	6	7	8	9		
(46)			U	N	D1	D2	F	MO	MR	X	M2 [31]	(52)
(47)			U	N	D1	D2	F	MO	MR	X	M3 [32]	(53)

(78-80) END CARD NO. 3 — 1 4 3

START CARD NO. 4 (REPEAT COLS. 1-21)

3. GINGIVA - UPPER RIGHT

COL. NO.						
(22)	0	1	2	6	8	NC
(23)	0	1	2	6	8	NC
						9
(24)	0	1	2	6	8	NC
(25)	0	1	2	6	8	NC
(26)	0	1	2	6	8	NC
(27)	0	1	2	6	8	NC
						9
(28)	0	1	2	6	8	NC
(29)	0	1	2	6	8	NC

GINGIVA - UPPER LEFT

(30)	0	1	2	6	8	NC
(31)	0	1	2	6	8	NC
(32)	0	1	2	6	8	NC
						9
(33)	0	1	2	6	8	NC
(34)	0	1	2	6	8	NC
(35)	0	1	2	6	8	NC
						9
(36)	0	1	2	6	8	NC
(37)	0	1	2	6	8	NC

GINGIVA - LOWER LEFT

(38)	0	1	2	6	8	NC
(39)	0	1	2	6	8	NC
						9
(40)	0	1	2	6	8	NC
(41)	0	1	2	6	8	NC
(42)	0	1	2	6	8	NC
(43)	0	1	2	6	8	NC
						9
(44)	0	1	2	6	8	NC
(45)	0	1	2	6	8	NC

GINGIVA - LOWER RIGHT

(46)	0	1	2	6	8	NC
(47)	0	1	2	6	8	NC
						9
(48)	0	1	2	6	8	NC
(49)	0	1	2	6	8	NC
(50)	0	1	2	6	8	NC
(51)	0	1	2	6	8	NC
						9
(52)	0	1	2	6	8	NC
(53)	0	1	2	6	8	NC

(78-80) END CARD NO. 4 — 1 4 4

START CARD NO. 5 (REPEAT COLS. 1-21)
(CIRCLE ONE IN EACH ROW)

Col. No.								
	4. ORAL HYGIENE							
	UPPER ARCH:							
(22)	RIGHT	DEBRIS	0	1	2	3	NC	
(23)		CALCULUS	0	1	2	3	NC	
								9
(24)	ANTERIOR	DEBRIS	0	1	2	3	NC	
(25)		CALCULUS	0	1	2	3	NC	
(26)	LEFT	DEBRIS	0	1	2	3	NC	
(27)		CALCULUS	0	1	2	3	NC	
								9
	LOWER ARCH:							
(28)	LEFT	DEBRIS	0	1	2	3	NC	
(29)		CALCULUS	0	1	2	3	NC	
(30)	ANTERIOR	DEBRIS	0	1	2	3	NC	
(31)		CALCULUS	0	1	2	3	NC	
								9
(32)	RIGHT	DEBRIS	0	1	2	3	NC	
(33)		CALCULUS	0	1	2	3	NC	

		NONE	QUES.	V.M.	MILD	MOD.	SEV.	NC
5. OPACITIES								
(34)	FLUOROSIS	0	1	2	3	4	5	9
(35)	NON FLUORIDE	0			3	4	5	9

		YES	NO
(36)	6. ORTHODONTIC APPLIANCES PRESENT?	1	2
(37)	7. PARTIAL DENTURES PRESENT?	1	2

COMPLETE REMAINING ITEMS FOR ALL PERSONS

		NONE	SEL.	FIRM	ALL	UND 10
(38)	8. TROUBLE BITING OR CHEWING?	1	2	3	4	9

		NO	IF YES, DENTURE STATUS: PRES	ABS	DEF
(39)	9. EDENTULOUS ARCHES UPPER	1	2	3	4
(40)	LOWER	1	2	3	4

IF EDENTULOUS AND NO DENTURES IN PLACE, ASK ADULTS:

		U	L	BOTH	NO	NC
(41)	EVER HAD DENTURES?	1	2	3	4	9
(42)	NOW HAVE DENTURES?	1	2	3	4	9

10. IF SUBJECT HAS DENTURES, HOW MANY YEARS WITH THIS SET?

		0-1	2-4	5-9	10-19	20+	NC
(43)	UPPER	1	2	3	4	5	9
(44)	LOWER	1	2	3	4	5	9

IF EDENTULOUS BUT WITHOUT DENTURES, HOW MANY YEARS WITHOUT TEETH?

		0-1	2-4	5-9	10-19	20+	NC
(45)	UPPER	1	2	3	4	5	9
(46)	LOWER	1	2	3	4	5	9

		FULL	PART	NONE
(47)	11. PROSTHETIC APPLIANCES NEEDED: UPPER	1	2	3
(48)	LOWER	1	2	3

(49-50)	12. NUMBER OF TOOTH SPACES NEEDING REPLACEMENTS?	
(51-52)	13. TOTAL NUMBER OF EXTRACTIONS NEEDED (ALL CAUSES):	

		NONE	MIN.	MOD.	EXT.
(53)	14. PERIODONTAL TREATMENT RECOMMENDED:	0	1	2	3

		YES	NO
(54)	15. EMERGENCY TREATMENT NEEDED:	1	2

		0-1	2-4	5-9	10+	NEVER	UNK
(55)	16. NO. OF YEARS SINCE LAST DENTAL VISIT:	1	2	3	4	5	9

Col. No.

(56)	17. LIPS ANGLES	LES. 1	SCARS 2	BOTH 3	NO 4
(57)	CHEILOSIS	U 1	L 2	BOTH 3	NO 4

			IF YES: TREATMENT				
	18. CLEFTS	NO	GOOD	FAIR	POOR	INC	NONE
(58)	CLEFT LIP, UNILATERAL	0	1	2	3	4	5
(59)	CLEFT LIP, BILATERAL	0	1	2	3	4	5
(60)	CLEFT PALATE	0	1	2	3	4	5
(61)	BIFID UVULA	0	PRESENT 1				

19. OTHER PATHOLOGY (000000 = NONE)

(62-67)	50 = WHITE LESIONS
	51 = STOMATITIS NICOTINA
	52 = HEMORRHAGIC LESIONS
	53 = VESICULAR LESIONS
	54 = FIBROMA
	55 = GINGIVAL HYPERPLASIA
	56 = MAGENTA TONGUE
	57 = GEOGRAPHIC TONGUE
	58 = APHTHOUS LESION
	59 = GLOSSITIS
	60 = TORUS
	77 = OTHER

(68-71)	20. EXAMINER NO.	21. RECORDER NO.
(76)	22. DENTAL EXAMINATION: COMPLETE = 1,	INCOMPLETE = 2
(77)	23. REMARKS: YES 1 NO 2	
(78-80)	END OF CARD NUMBER 5	1 4 5

REMARKS

APPENDIX IV

HISTORICAL DEVELOPMENT OF THE TEN-STATE NUTRITION SURVEY 1968-1970

GUIDELINES FOR CLASSIFICATION AND INTERPRETATION OF GROUP BLOOD AND URINE DATA

Determination	Classification category		
	Less than acceptable		Acceptable [1]
	Deficient	Low	
Hemoglobin, g/100 ml			
6–23 months	< 9.0	9.0– 9.9	≧ 10.0
2– 5 yr	< 10	10.0–10.9	≧ 11.0
6–12 yr	< 10	10.0–11.4	≧ 11.5
13–16 yr, male	< 12	12.0–12.9	≧ 13.0
13–16 yr, female	< 10	10.0–11.4	≧ 11.5
>16 yr, male	< 12	12.0–13.9	≧ 14.0
>16 yr, female	< 10	10.0–11.9	≧ 12.0
Pregnant, 2nd trimester	< 9.5	9.5–10.9	≧ 11.0
Pregnant, 3rd trimester	< 9.0	9.0–10.4	≧ 10.5
Hematocrit, %			
6–23 months	< 28	28–30	≧ 31
2– 5 yr	< 30	30–33	≧ 34
6–12 yr	< 30	30–35	≧ 36
13–16 yr, male	< 37	37–39	≧ 40
13–16 yr, female	< 31	31–35	≧ 36
>16 yr, male	< 37	37–43	≧ 44
>16 yr, female	< 31	31–37	≧ 38
Pregnant, 2nd trimester	< 30	30–34	≧ 35
Pregnant, 3rd trimester	< 30	30–32	≧ 33
Hemoglobin conc, MCHC, g/100 ml RBC			
All ages	—	30	≧ 30
Serum iron, μg/100 ml			
0– 5 months	—		—
6–23 months	<30		≧ 30
2– 5 yr	<40		≧ 40
6–12 yr	<50		≧ 50
>12 yr, male	<60		≧ 60
>12 yr, female	<40		≧ 40
Transferrin saturation, %			
0 –5 months	—		—
6–23 months	<15		≧ 15
2–12 yr	<20		≧ 20
>12 yr, male	<20		≧ 20
>12 yr, female	<15		≧ 15
Red cell folacin, ng/ml			
All ages	<140	140–159	≧160–650
Serum folacin, ng/ml	3.0	3.0– 5.9	≧ 6.0

Determination	Classification category		
	Less than acceptable		Acceptable [1]
	Deficient	Low	
Serum protein, g/100 ml			
0–11 months		<5.0	≧ 5.0
1– 5 yr		<5.5	≧ 5.5
6–17 yr		<6.0	≧ 6.0
Adult	< 6.0	6.0– 6.4	≧ 6.5
Pregnant, 2nd and 3rd trimester	< 5.5	5.5– 5.9	≧ 6.0
Serum albumin, g/100 ml			
0–11 months		<2.5	≧ 2.5
1– 5 yr		<3.0	≧ 3.0
6–17 yr		<3.5	≧ 3.5
Adult	< 2.8	2.8– 3.4	≧ 3.5
Pregnant, 1st trimester	< 3.0	3.0– 3.9	≧ 4.0
Pregnant, 2nd and 3rd trimester	< 3.0	3.0– 3.4	≧ 3.5
Serum vitamin C, mg/100 ml			
0–11 months	—	—	—
≧1 yr	< 0.1	0.1– 0.19	≧ 0.2
Plasma carotene, μg/100			
0– 5 months		<10	≧ 10
6–11 months		<30	≧ 30
1–17 yr		<40	≧ 40
Adult	< 20 [2]	20–39	≧ 40
Pregnant, 2nd trimester		30–79	≧ 80
Pregnant, 3rd trimester		40–79	≧ 80
Plasma vitamin A, μg/100 ml			
All ages	< 20	20–29	≧ 30
Urinary thiamine, μg/g creatinine			
1– 3 yr	<120	120–175	≧176
4– 6 yr	< 85	85–120	≧121
7– 9 yr	< 70	70–180	≧181
10–12 yr	< 60	60–180	≧181
13–15 yr	< 50	50–150	≧151
Adult	< 27	27– 65	≧ 66
Pregnant, 2nd trimester	< 23	23– 54	≧ 55
Pregnant, 3rd trimester	< 21	21– 49	≧ 50
Urinary riboflavin, μg/g creatinine			
1– 3 yr	<150	150–499	≧500
4– 6 yr	<100	100–299	≧300
7– 9 yr	< 85	85–269	≧270
10–15 yr	< 70	70–199	≧200
Adult	< 27	27– 79	≧ 80
Pregnant, 2nd trimester	< 39	39–119	≧120
Pregnant, 3rd trimester	< 30	30– 89	≧ 90
Urinary iodine, μg/g creatinine	< 25	25– 49	≧ 50

[1] Excessively high levels may indicate abnormal clinical status or toxicity.
[2] May indicate unusual diet or malabsorption.

APPENDIX V

HISTORICAL DEVELOPMENT OF THE TEN-STATE NUTRITION SURVEY 1968-1970

METHODOLOGY USED TO OBTAIN LABORATORY DATA

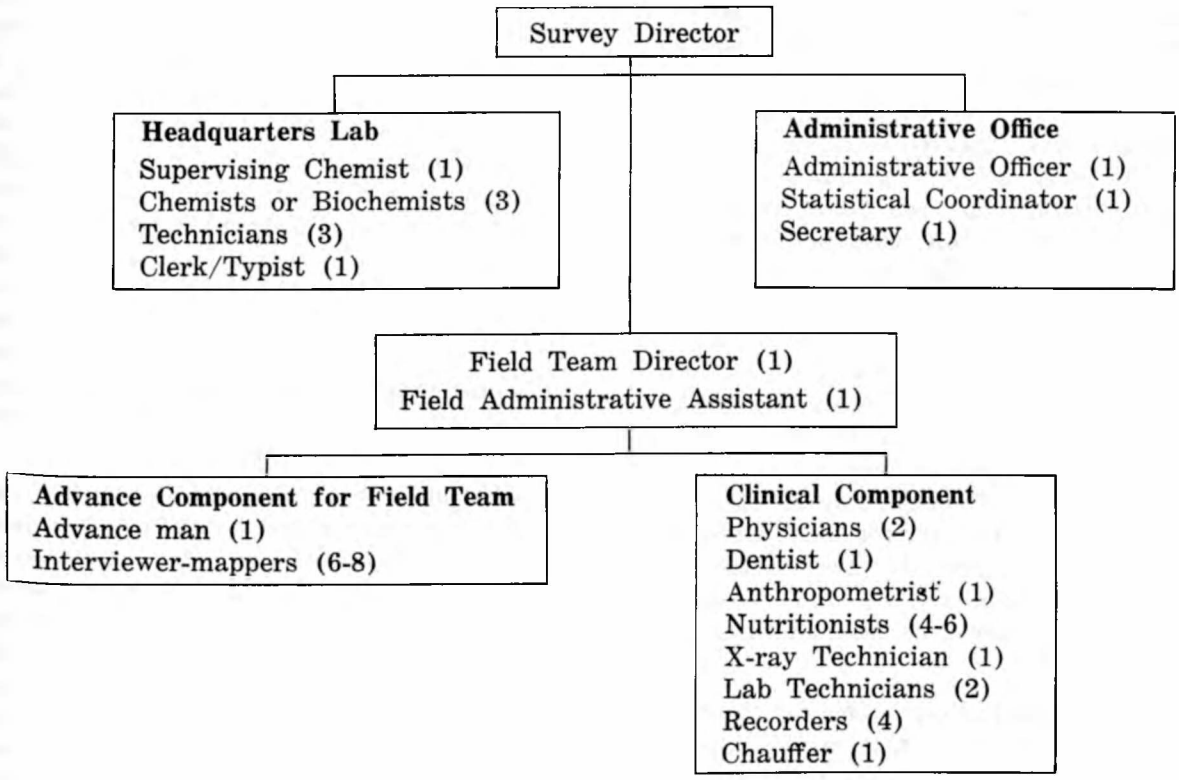
Determination	Method
Hemoglobin	Cyanmethemoglobin [1]
Hematocrit	Micromethod [2]
Serum iron	Giovanniello [3]
Serum iron-binding capacity	Caraway [4]
Blood folacin	*Lactobacillus casei* [5]
Total serum protein	Biuret [6]
Serum albumin	2-(4′-hydroxyazobenzene) benzoic acid (HABA) [6]
Serum vitamin C	Macro dinitrophenyl-hydrazine [1]
Plasma carotene and vitamin A	Macro Carr-Price (trifluoroacetic acid chromogen) [1]
Urinary creatinine	Picrate [6]
Urinary thiamine	Thiochrome [1]
Urinary riboflavin	Modified Slater-Morell [1]
Urinary iodine	Modified Zak [1]

[1] Manual for nutrition surveys, 2nd ed., Interdepartmental Committee on Nutrition for National Defense, 1963.
[2] M. M. Wintrobe: Clinical hematology, 6th ed. (Lea & Febiger, Philadelphia 1967).
[3] Modified procedure: Giovanniello, T. J.; DiBenedetto, G.; Palmer D. W. and Peters, T., Jr.: Fully and semi-automated methods for the determination of serum iron and total iron-binding capacity. J. Lab. Clin. Med. *71:* 874 (1968).
[4] Modified procedure: Caraway, W. T.: Macro and micro methods for the determination of serum iron and iron-binding capacity. Clin. Chem. *9:* 188 (1963).
[5] Modified by U.S. Army Medical Research and Nutrition Laboratory, Fitzsimons General Hospital, Denver Colo.
[6] Technician auto analyzer methodology, Technicon Instruments Corporation, Chauncey, N.Y.

APPENDIX VI

HISTORICAL DEVELOPMENT OF THE TEN-STATE NUTRITION SURVEY 1968-1970

ORGANIZATION AND FUNCTIONS—SURVEY TEAMS



I. **HEADQUARTERS PERSONNEL:**

A. **Survey Director:** Should be a senior administrative health professional, preferably from the contracting organization. This is a full-time job with responsibility for the organization and coordination of all survey operations, including pre-survey professional, organizational, and community contacts. The major duties include:

1. Assuring top level support for all phases of survey activity.
2. Selection and orientation of key personnel.
3. Pre-survey contact with professional organizations such as county medical societies and government organizations such as Education, OEO, USDA; and contact with various community health and civic officials in the areas to be surveyed.
4. The pre-survey activity should be planned and carried out under the direct supervision of the survey director, utilizing various team members at the director's discretion. The nature of the contacts makes it imperative that the individuals are professionally qualified and command the respect of the groups contacted. They must understand the entire survey operation. In most instances it would appear that the survey director, the field team director, and perhaps the administrative officer would serve in this capacity. It is desirable that during this initial activity the survey be clearly identified as a health project.

B. **Administrative Officer:** The complexity of organizing and carrying out the surveys in a relatively short time requires that the survey director have the full-time support of a senior administrative person, preferably assigned from within the contracting organization. His role is most crucial in the organizational phase and the first part of the survey, but a full-time commitment will be necessary throughout field work also.

His primary responsibilities will be to coordinate and expedite recruitment, purchasing, and scheduling; and general administration in the organizational phase, working closely with the Nutrition Program staff in obtaining clearances required by the contract.

During the field work portion of the survey, he will be also responsible for assuring that reports, both program and financial, are submitted to the Nutrition Program.

He will assure proper arrangements for key punching and forwarding all data to the Nutrition Program for data processing. He may be actively involved in advanced field team activity and in some instances may serve as field administrative assistant.

C. **Laboratory Chief:** Responsible for the collection, handling and analyses of samples in the field and the headquarter's laboratory. Also responsible for sending the proper samples to Denver and to Boston. He should coordinate all aspects of the laboratory work with the field team director.

II. FIELD TEAM PERSONNEL:

A. **Field Team Director:** Under the direction of the survey director, assumes full responsibility for all field activity; coordination of clinic and advance operations to assure maximum participation and efficiency. This position should be filled by a health professional.

B. **Field Administrative Assistant:** Has major responsibility under the direct supervision of the field team director for implementing the advance arrangements for the clinic operation. Coordinates local arrangements for publicity, housing, mapping and interview schedules, etc. Coordinates regular transportation of all laboratory samples to central laboratory.

C. **Mappers:** Responsible for mapping ED's and selection of sample households.

D. **Interviewers:** These are key individuals and should be selected with extreme care. Their initial contact for soliciting participation is basic to the success of the survey. The fact that in almost all instances this contact is made with the housewife is worthy of note. Experience has shown that the most successful interviewers are usually mature females. The public health nurse, a well-known teacher, the dietary interviewers, or indigenous persons to accompany an "outsider" have been consistently noted by the National Health Survey, the Census Bureau, and other survey groups to yield maximum participation. Consideration should be given also to the cultural and ethnic makeup of the sample population in choosing interviewers.

E. **Clinical Team:** All members should meet the usual professional standards for their respective positions as well as state licensing requirements. The *clinical director* must have sufficient maturity to maintain a professional atmosphere within the clinic at all times. One *nutritionist* should have qualifications that enable her to serve as director for all dietary data collection and coding. It is highly desirable that a *nurse* be a member of the field team, either in the advance component or the clinical group.

Physicians: Clinical examination and medical history.

Dentists: See Guidelines and Procedures.

Nutritionists: See Guidelines and Procedures.

Anthropometrists: See Guidelines and Procedures.

X-ray Technician: See Guidelines and Procedures.

Recorders: Will fill out the survey forms in conjunction with the professional team, e.g., dentists, anthropometrists and the registrar as they perform their respective examinations and measurements. Should be able to operate interchangeably. All team members will be responsible for editing their respective forms during or after each clinic.

Laboratory Technician: Draws blood, handles urine specimen and performs field laboratory analysis.

Registrar: Records entry of families into clinic, verifies family census, completes general household information, answers general questions, helps direct participant flow in the clinic, and looks after general participant well-being. Checks with each subject as he leaves the clinic to make sure all examinations are complete.

Chauffer: Overall responsibility for packing and transporting clinic equipment. Helps set up clinics. Picks up and delivers participants between the clinic and their homes. Transports blood samples and personnel as need arises.

Chapter II – DEMOGRAPHIC DATA TEN-STATE NUTRITION SURVEY

Chapter II

DEMOGRAPHIC DATA TEN-STATE NUTRITION SURVEY

INTRODUCTION

Interpretation of the Ten-State Nutrition Survey data requires a thorough understanding of the demographic characteristics of the families and individuals studied. This section presents an analysis of demographic characteristics with emphasis on major factors that influence nutritional status. At the most fundamental level this includes an analysis of the age and sex characteristics of the population, since food intakes and nutritional requirements vary widely with age and sex. The ethnic make-up of the population and an index of economic status are also presented. Utilization of survey data in developing programs to improve nutritional status must take into consideration these socioeconomic characteristics, which bear heavily on nutrition.

Other characteristics of the survey population that are summarized in this section include family size and number of years of school completed. Factors such as these are often interrelated with other social and economic characteristics, but singly or together they play a role in determining nutritional status.

GENERAL DESCRIPTION

Selection of the Sample. Over 30,000 families were selected to participate in the Ten-State Nutrition Survey. The procedure employed in the selection of the sample was described in detail in Chapter I of this report. Within the ten states and New York City, the percentage of the selected families who were actually interviewed varied from 60 to 100 percent (Table 1). This wide variation came about for two reasons. First, there were occasional families that did not wish to be included. Second, and probably the weightier factor, the areas to be surveyed had been selected on the basis of data collected for the 1960 census. During the interval between 1960 and the beginning of the survey in early 1968, many changes had taken place. In some instances surveyors found only an empty house or a vacant lot at a spot where in 1960 a family had lived. Therefore, the actual total number of families selected was greater than the 29,935 shown in Table 1, and the total percentage participating was correspondingly less than the 79.6 percent shown in the table.

The very high percentage of participating families recorded for Louisiana, Massachusetts, Michigan, New York City, and Texas reflects the omission of families that were selected but were not available for interview and testing.

Interview. Of the total number of families selected, 23,846 families were actually interviewed and therefore participated in the survey. Demo-

Table 1. *Number of Persons Participating in Survey by State—Ten-State Nutrition Survey (1968-1970)*

State	Number of Families in Survey	Number of Families Interviewed	Percent of Families Interviewed	Number of Persons Interviewed	Number of Persons Attending Clinic	Percent of Interviewed Persons Attending Clinic
Total	29935	23846	79.6	86352	40847	47.3
California	5996	4134	68.9	13543	6089	45.0
Kentucky	1590	1116	70.2	4056	1719	42.4
Louisiana	1814	1796	99.0	7469	4920	65.9
Massachusetts	3096	3093	99.9	10669	4376	41.0
Michigan	1683	1671	99.3	6368	2357	37.0
New York City	1497	1497	100.0	4884	1979	40.5
New York State	2965	2204	74.3	6981	3202	45.9
South Carolina	3171	2088	65.8	9803	4776	48.7
Texas	1813	1813	100.0	8071	4465	55.3
Washington	4469	2995	67.0	9272	5336	57.5
West Virginia	1841	1439	78.2	5236	1628	31.1

graphic data were obtained for all participating families during the interview.

The nearly 24,000 families participating in the Ten-State Nutrition Survey included a total of 86,352 persons (Table 1). This survey, including as it did over 86,000 individuals, represents the largest and most comprehensive study of its kind ever conducted.

Clinical Examinations. All members of the interviewed families were invited to attend a special clinic, where a detailed medical and nutritional evaluation was conducted. This included anthropometric, clinical, biochemical, dietary, dental, and X-ray assessments of the participants. Slightly less than one-half (47.3 percent) of the individuals comprising the interviewed families attended these clinics (Table 1). The proportion of interviewed persons who attended clinics varied from 31.1 percent in West Virginia to 65.9 percent in Louisiana.

Volunteers. The percentages in Table 1 do not represent the true proportion of those persons in the selected sample who participated in the survey. In some areas, individuals who had not initially been identified in the same procedure volunteered to participate. These persons were then interviewed and examined in the clinics.[1] Of the 86,352 individuals interviewed, 13,858 were in the volunteer category; of the 40,847 individuals examined in the clinics, 8,441 were not in the initial sample. Data comparing the volunteers with those who were selected in the initial sample will be presented in the sections to follow.

COMPARISON BETWEEN INDIVIDUALS ATTENDING AND NOT ATTENDING CLINICS

Demographic data were obtained for all persons participating in the survey. However, only 47.3 percent of participating individuals attended clinics where additional data (see above) were obtained. The data presented in Tables 2A through 5 illustrate the comparability between the persons who attended clinics and those who did not attend clinics. A comparison of these two groups of individuals (those who attended and those who did not attend clinics) is important in determining to what extent the data obtained during clinic visits are representative of the total survey population.

Ethnic Composition. The distribution, by ethnic group, of persons attending and not attending clinics did not vary widely in most areas (Table 2A). Some differences were found, however, in California, Kentucky, Louisiana, and South Carolina.

In California, the percentage of Spanish-American persons attending clinic was higher than the percentage who did not attend. In contrast, the percentage of black individuals who attended clinic was smaller than the percentage who did not attend clinic. In Kentucky, Louisiana, and South Carolina, the proportion of clinic attenders who were black persons was considerably greater than the proportion of nonattenders who were black.

In Kentucky, white individuals comprised 72.7 percent of the persons attending clinics and 79.7 percent of persons who did not attend clinics. In Louisiana, white individuals made up 21.3 percent of those attending clinics as compared to 29.5 percent of those not attending. In South Carolina, 4.6 percent of those attending clinics were white, whereas 11.7 percent of those who did not attend were white. In each of these three states the proportion of clinic attenders who were black persons was considerably greater than it was for nonattenders.

Overall, the distribution, by ethnic group, of the people who attended clinics closely paralleled that of the people who did not attend. As shown in the first two lines of Table 2A, white persons comprised 46.2 percent of the total number of people attending clinics and 51.8 percent of those not attending; black persons made up 35.4 percent of those who attended clinics and 32.2 percent of those who did not; and people of Spanish-American origin represented 14.5 percent of those attending clinics and 12.2 percent of those not attending.

In California, some 5 percent of both groups (those attending clinics and those not attending) were of Oriental origin, and in the state of Washington, 9.8 percent and 9.2 percent of those attending and those not attending clinics, respectively, were American Indians. Overall, however, these two ethnic groups represented less than 3 percent of the total clinic population, while white, black, and Spanish-American persons together made up 96 percent of those who attended clinics and 96 percent of those who did not attend.

The distribution by ethnic group of children (age less than 17 years) attending and not attending clinics (Table 2B) showed the same general pattern that was seen for the total population (Table 2A). Of the children attending clinics, 39.3 percent were white, 40 percent were black, and 16.2 percent were Spanish-American. Compared to the total population, the pediatric group attend-

[1] Throughout this report, the term "volunteer" is used to identify these persons.

ing clinics had a somewhat higher percentage of black children and a slightly lower percentage of white children.

Table 2C shows that, in terms of ethnic distribution, the degree of comparability between volunteers attending and not attending clinics was similar to that of the total population (Table 2A).

The number and ethnic composition of persons attending clinics (Figure 1) varied widely from state to state. In Kentucky, New York City, and West Virginia, less than one-third as many persons attended clinics as in California. Kentucky, New York State, Washington, and West Virginia had clinic populations that were predominantly white, while those in Louisiana and South Carolina were predominantly black. In California, New York City, and Texas, large numbers of Spanish-American persons attended clinics. However, the actual ethnic background of the Spanish-American population was somewhat different in each of these three areas. In New York City the Spanish-Americans were predominantly Puerto Rican; in Texas and California they were predominantly Mexican-American.

Table 2A. *Comparison of the Ethnic Distribution of Persons Attending and Not Attending Clinic by State (All Ages)—Ten-State Nutrition Survey (1968-1970)*

State	Total		Ethnic Group (Percent Distribution)					
	Number	Percent	White	Black	Spanish American	Oriental	American Indian	Unknown
Total								
Attending	40847	100.0	46.2	35.4	14.5	1.1	1.7	1.1
Not Attending	45505	100.0	51.8	32.2	12.2	1.3	1.1	1.3
California								
Attending	6089	100.0	41.4	14.8	36.9	5.1	1.8	0.1
Not Attending	7454	100.0	44.2	20.6	18.8	5.6	0.7	0.1
Kentucky								
Attending	1719	100.0	72.7	24.8	0.0	0.1	0.0	2.4
Not Attending	2337	100.0	79.7	15.5	0.0	0.0	0.0	4.8
Louisiana								
Attending	4920	100.0	21.3	73.8	0.3	0.0	0.7	4.0
Not Attending	2549	100.0	29.5	64.7	0.4	0.0 [1]	0.3	5.1
Massachusetts								
Attending	4376	100.0	82.2	11.2	5.1	0.4	0.0	1.1
Not Attending	6293	100.0	80.5	15.0	3.7	0.3	0.0	0.5
Michigan								
Attending	2357	100.0	51.5	47.8	0.2	0.0	0.5	0.1
Not Attending	4011	100.0	49.0	48.3	0.4	0.1	1.5	0.6
New York City								
Attending	1979	100.0	12.8	43.1	42.3	1.8	0.0	0.0
Not Attending	2905	100.0	14.8	42.7	40.7	1.8	0.0 [1]	0.0
New York State								
Attending	3202	100.0	79.3	17.6	2.2	0.1	0.6	0.2
Not Attending	3779	100.0	78.8	19.0	1.5	0.2	0.5	0.0 [1]
South Carolina								
Attending	4776	100.0	4.6	95.0	0.1	0.0	0.4	0.0 [1]
Not Attending	5027	100.0	11.7	87.8	0.0	0.1	0.1	0.4
Texas								
Attending	4465	100.0	9.4	35.2	54.2	0.0	0.1	1.1
Not Attending	3606	100.0	12.8	34.6	51.0	0.0 [1]	0.0	1.5
Washington								
Attending	5336	100.0	81.5	3.7	1.9	1.4	9.8	1.7
Not Attending	3936	100.0	75.7	6.9	1.4	1.7	9.6	4.8
West Virginia								
Attending	1628	100.0	88.6	10.6	0.1	0.4	0.0	0.3
Not Attending	3608	100.0	89.0	9.9	0.0	0.1	0.0	1.0

[1] Value less than 0.05.

Age Distribution. Comparison of the ages of persons attending and not attending clinics (Table 3A) revealed interesting and yet quite understandable trends. For preschool-age children there were only small differences in the percentages of those attending and not attending. For school-age children (6 to 17 years) the percentage of persons attending clinics tended to be higher than the percentage not attending. Beginning with the 17- to 19-year age group and continuing through the adult groups there was a reversal, with the percentages of individuals attending clinics somewhat lower than the percentages not attending. With only a few minor exceptions, these differences held true in all 11 areas surveyed.

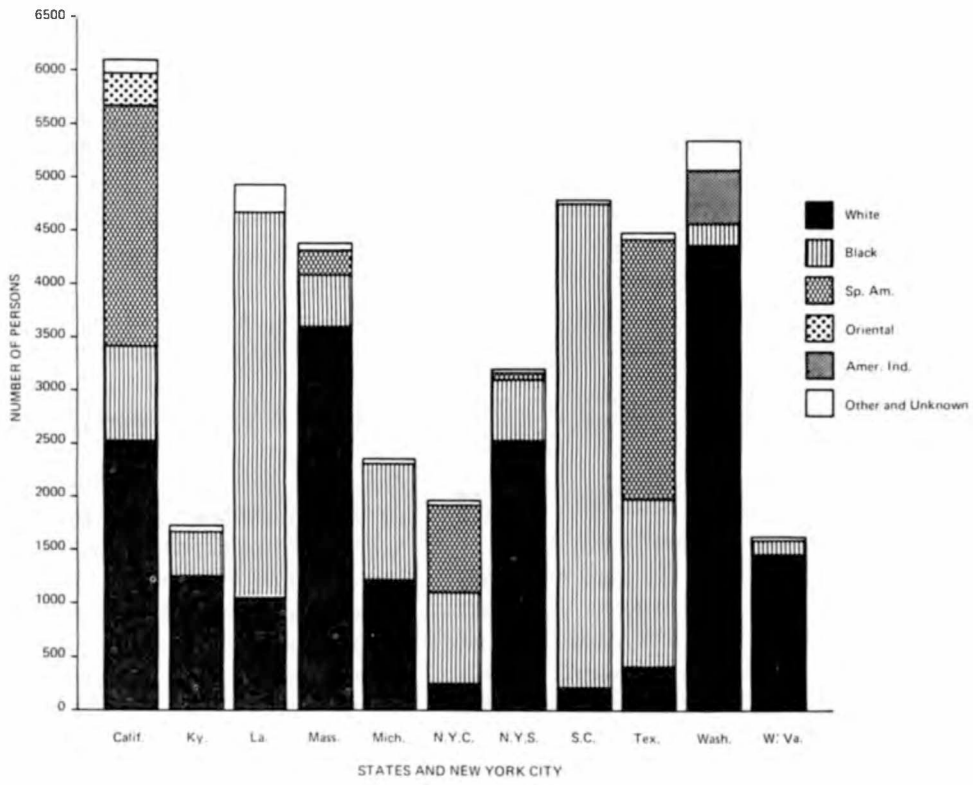
In summary, attendance at clinics was best for school-age children and poorest for persons over 17 years of age. This latter group included persons of working age, a fact that may explain the poorer clinic attendance for people 17 years of age and older.

The age distribution of volunteers attending and not attending clinics (Table 3B) was similar to that of the total population. Among the volunteers, school-age children had the best clinic attendance and adults the poorest. The total number of volunteers attending clinics was most significant in California, Louisiana, and Washington, with more than 1,500 volunteers in each state attending the clinics. Massachusetts, Michigan, and West Virginia had large but less significant numbers of volunteers among their clinic populations.

Formal Schooling. When persons over age 21 attending clinics and those not attending clinics were compared with respect to the number of years of school completed, no consistent differences were found (Table 4). Almost 27 per cent of the over-21 adults had completed from 5 to 8 years of school, both those attending clinics and those not attending clinics. Approximately 40 per cent of the persons attending and 45 per cent of those not attending had completed from 9 to 12 years of school. There was some variation in this regard from state to state, but overall, the clinic and the non-clinic populations were similar.

Family Income. An additional comparison of persons attending and not attending clinics was made on the basis of family income. The data in Table 5 show that there was no consistent relationship between income level and the percentage of families attending and not attending clinics. The families represented in this table include only those for whom income information was available.

Figure 1—Comparison of Ethnic Composition and Number of Persons Attending Clinics by State (All Ages)—Ten-State Nutrition Survey (1968-1970)



In many states there was considerable disparity in clinic attendance between families with and families without such information available, making meaningful comparison between the two groups difficult.

Summary. The conclusion can be drawn that in most respects people attending clinics, including volunteers, differed little from those not attending. The most striking difference between the two groups was in the age distribution. The population attending clinic contained a disproportionately high percentage of school-age children. In some states there was a moderate disparity in ethnic composition between the group attending clinics and the group not attending.

COMPARISON OF SURVEY POPULATIONS WITH CENSUS DATA

As noted previously, the selection of the survey sample was based on 1960 census data. By 1968, when the survey was initiated, population changes had occurred that varied in degree from state to state. It is important therefore to compare the survey population, and particularly the subsample represented by those attending clinics, with the total populations of the states from

Table 2B. *Comparison of the Ethnic Distribution of Persons Attending and Not Attending Clinic by State (Age Less Than Seventeen)—Ten-State Nutrition Survey (1968-1970)*

State	Total		Ethnic Group (Percent Distribution)					
	Number	Percent	White	Black	Spanish American	Oriental	American Indian	Unknown
Total								
Attending	21214	100.0	39.3	40.0	16.2	1.0	2.3	1.2
Not Attending	15699	100.0	47.2	34.9	14.2	1.0	1.5	1.3
California								
Attending	3009	100.0	32.7	16.0	44.2	4.7	2.3	0.1
Not Attending	2480	100.0	37.0	23.5	34.4	4.5	0.6	0.1
Kentucky								
Attending	796	100.0	73.1	23.4	0.0	0.0	0.0	3.5
Not Attending	795	100.0	78.7	16.7	0.0	0.0	0.0	4.5
Louisiana								
Attending	2671	100.0	17.9	76.6	0.2	0.0	1.0	4.3
Not Attending	808	100.0	26.9	66.3	0.6	0.0	0.1	6.1
Massachusetts								
Attending	2153	100.0	80.8	12.3	5.4	0.4	0.0	1.1
Not Attending	2276	100.0	77.2	18.2	3.6	0.4	0.0	0.5
Michigan								
Attending	1331	100.0	45.9	53.7	0.0	0.0	0.4	0.0
Not Attending	1572	100.0	45.5	51.9	0.0	0.3	1.8	0.5
New York City								
Attending	984	100.0	7.6	45.7	44.9	1.7	0.0	0.0
Not Attending	1121	100.0	8.8	45.9	43.9	1.3	0.0	0.0
New York State								
Attending	1396	100.0	72.3	24.2	2.4	0.1	0.6	0.3
Not Attending	1151	100.0	72.5	25.0	1.3	0.3	0.9	0.0
South Carolina								
Attending	2988	100.0	4.2	95.4	0.1	0.0	0.3	0.1
Not Attending	1668	100.0	9.5	90.2	0.0	0.0	0.1	0.2
Texas								
Attending	2587	100.0	6.3	35.9	56.1	0.0	0.1	1.2
Not Attending	1352	100.0	9.3	32.3	55.5	0.0	0.0	1.3
Washington								
Attending	2539	100.0	75.7	4.1	2.6	1.3	14.3	1.9
Not Attending	1198	100.0	69.7	8.1	2.2	0.7	14.8	4.6
West Virginia								
Attending	760	100.0	84.2	15.3	0.1	0.4	0.0	0.0
Not Attending	1278	100.0	87.2	11.5	0.0	0.0	0.0	1.3

which the survey samples were selected. For these comparisons, census data for both 1960 and 1970 were employed.

In relation to the total state populations both in 1960 and in 1970, children under 17 years of age tended to be over-represented among those persons attending clinics (Figures 2A and 2B).[1] The older population (17 years of age and over) was under-represented in relation to state populations. This was true for both sexes and in both the "low-income-ratio" states and the "high-income-ratio" states.[2] The over-representation of children was more consistent and striking than the under-representation of older persons. In addition, the under-representation of the older population, although seen for both sexes, was more apparent for males than for females.

The ethnic composition of the population attending clinics was markedly different from that of the total state populations as described in the 1970 census. In the low-income-ratio states, at all ages the white population was strikingly under-represented by the clinic population (Figure 3A).

[1] Similar comparisons are presented in Appendix Tables 1A and 1B.

[2] The basis for the separation of the survey population into these two groups (low-income-ratio, Figure 2A, and high-income-ratio, Figure 2b is explained subsequently (see *Income Ratio of States*, page 11).

Table 2C. *Comparison of the Ethnic Distribution of Volunteers*[1] *Attending and Not Attending Clinic by State (All Ages)—Ten-State Nutrition Survey (1968-1970)*

State	Total		Ethnic Group (Percent Distribution)					
	Number	Percent	White	Black	Spanish American	Oriental	American Indian	Unknown
Total								
Attending	8301	100.0	49.8	28.1	16.5	1.4	2.6	1.6
Not Attending	6154	100.0	51.3	31.5	10.2	1.6	1.7	3.6
California								
Attending	2038	100.0	33.4	14.8	43.2	4.3	4.3	0.0 [2]
Not Attending	715	100.0	23.6	22.4	40.4	8.5	4.5	0.6
Kentucky								
Attending	67	100.0	0.0	100.0	0.0	0.0	0.0	0.0
Not Attending	9	100.0	0.0	100.0	0.0	0.0	0.0	0.0
Louisiana								
Attending	1592	100.0	18.7	75.1	0.4	0.0	1.9	3.9
Not Attending	562	100.0	17.8	67.1	1.1	0.0	0.7	13.3
Massachusetts								
Attending	447	100.0	62.6	17.0	19.2	0.0	0.0	1.1
Not Attending	943	100.0	53.6	36.6	8.3	0.0	0.0	1.6
Michigan								
Attending	568	100.0	50.9	48.6	0.4	0.0	0.2	0.0
Not Attending	1016	100.0	32.8	62.8	0.6	0.6	2.8	1.0
New York City								
Attending	154	100.0	12.3	42.9	44.8	0.0	0.0	0.0
Not Attending	134	100.0	17.9	41.8	40.3	0.0	0.0	0.0
New York State								
Attending	—	—	—	—	—	—	—	—
Not Attending	—	—	—	—	—	—	—	—
South Carolina								
Attending	141	100.0	4.3	93.6	2.1	0.0	0.0	0.0
Not Attending	92	100.0	15.2	81.5	1.1	0.0	0.0	2.2
Texas								
Attending	258	100.0	0.4	3.5	96.1	0.0	0.0	0.0
Not Attending	155	100.0	0.0	0.0	100.0	0.0	0.0	0.0
Washington								
Attending	2407	100.0	85.1	4.3	3.0	1.2	3.9	2.5
Not Attending	1504	100.0	80.3	5.9	2.5	2.1	3.2	6.1
West Virginia								
Attending	629	100.0	81.9	17.3	0.0	0.5	0.0	0.3
Not Attending	1024	100.0	78.9	18.4	0.0	0.2	0.0	2.5

[1] Volunteers are all persons who were not selected as part of the original sample.
[2] Value less than 0.05.

Figure 2a—Comparison of the Percentage Distribution of Persons Attending Clinic with State Populations in 1960 and 1970 by Age and Sex for Low Income Ratio States—Ten-State Nutrition Survey (1968-1970)

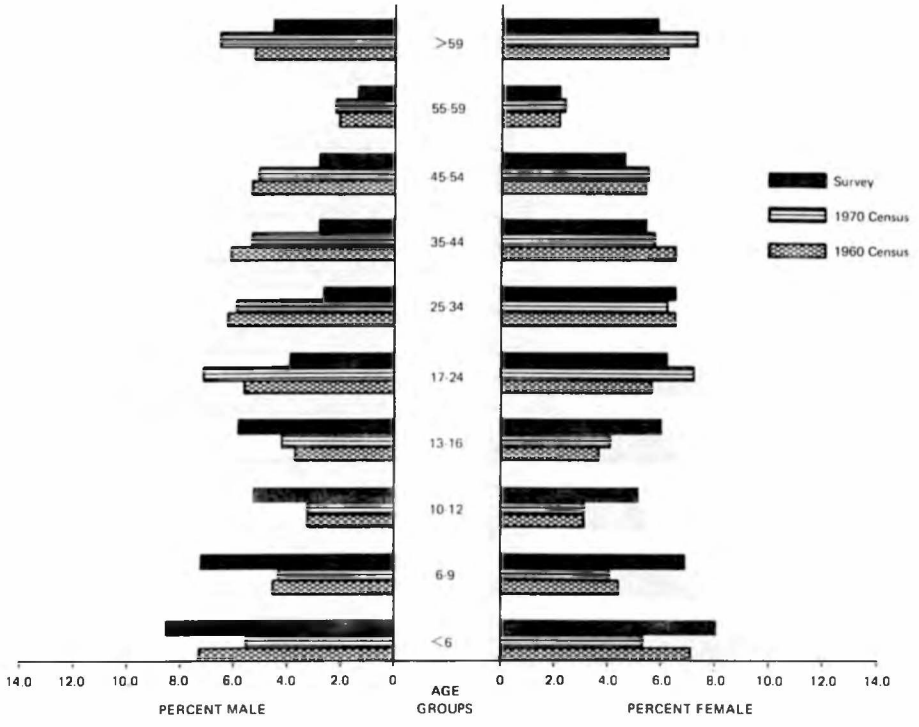


Figure 2b—Comparison of the Percentage Distribution of Persons Attending Clinic with State Populations in 1960 and 1970 by Age and Sex for High Income Ratio States —Ten-State Nutrition Survey (1968-1970)

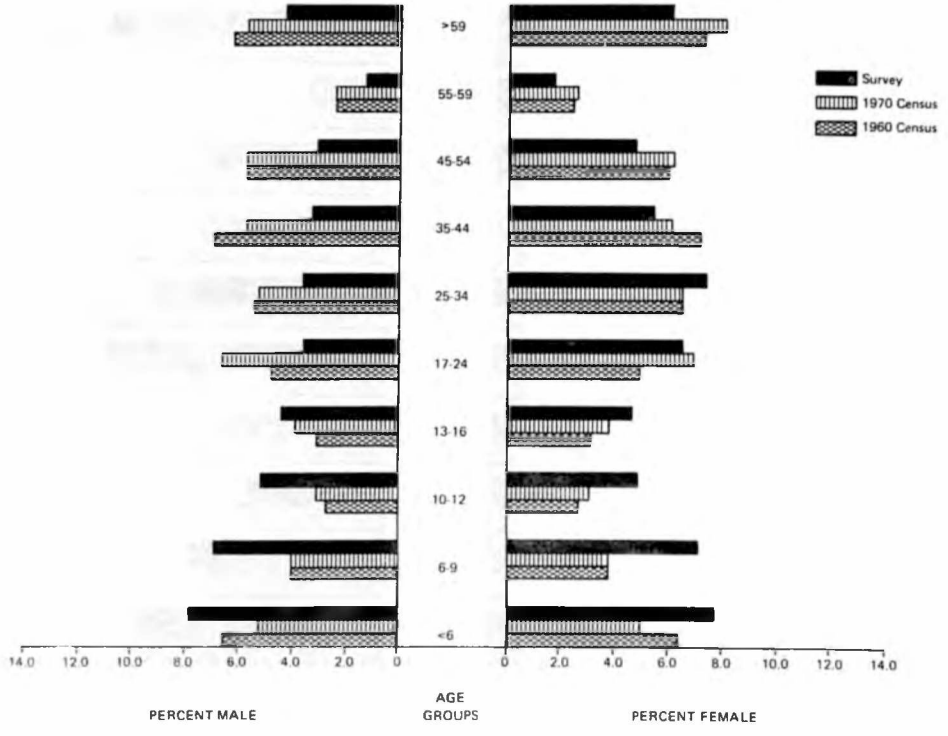


Figure 3a—Comparison of the Percentage Distribution of Persons Attending Clinic with State Populations in 1970 by Age and Ethnic Group for Low Income Ratio States—Ten-State Nutrition Survey (1968-1970)

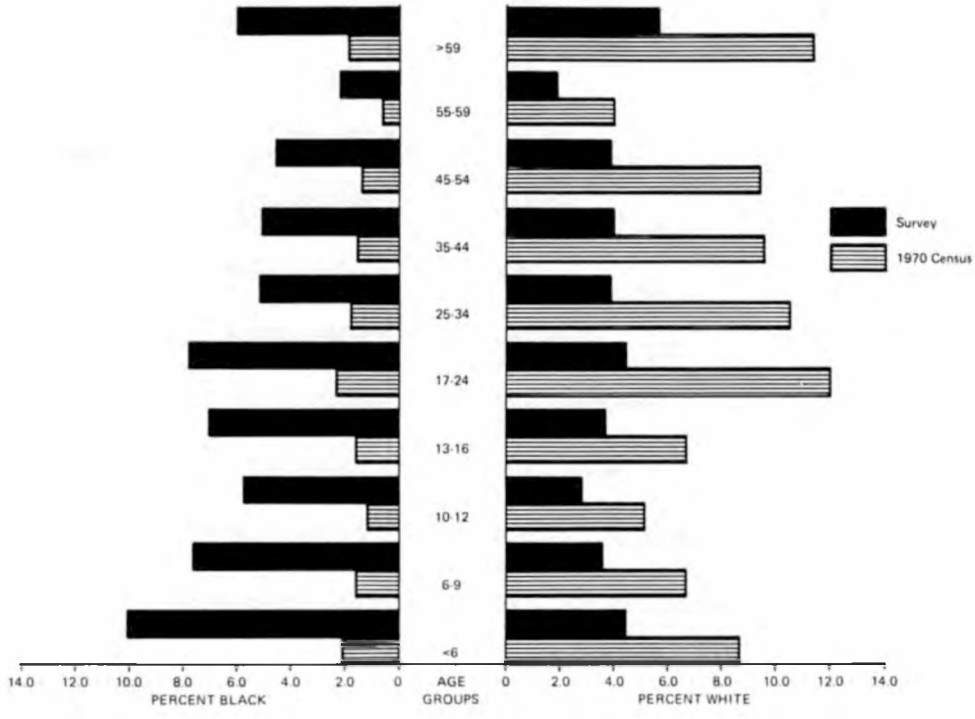
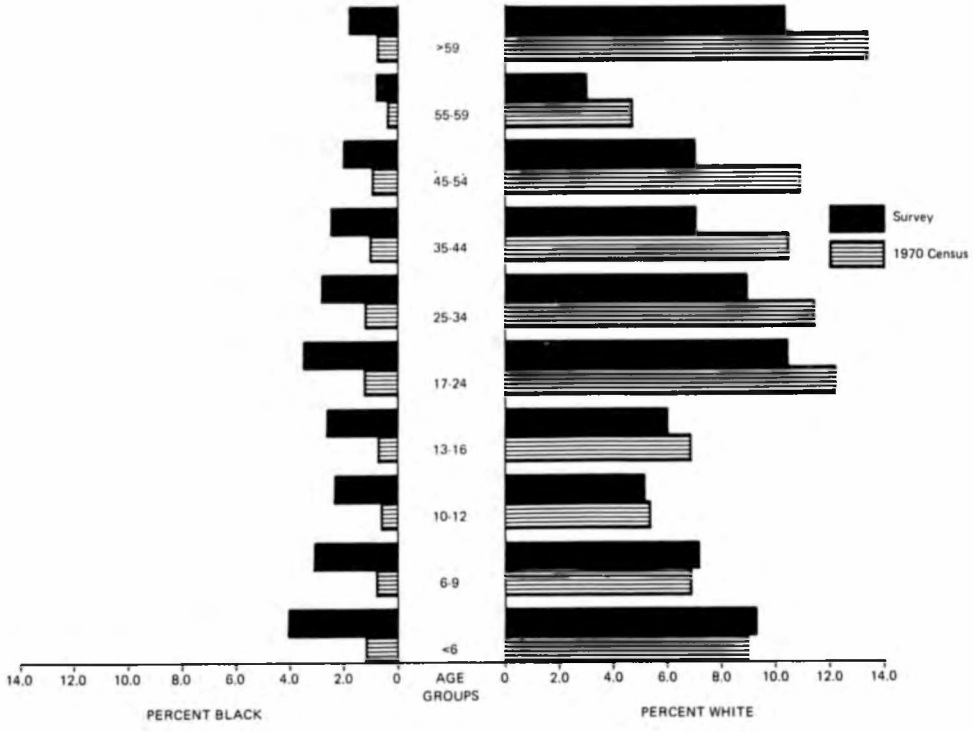


Figure 3b—Comparison of the Percentage Distribution of Persons Attending Clinic with State Populations in 1970 by Age and Ethnic Group for High Income Ratio States—Ten-State Nutrition Survey (1968-1970)



In contrast, black persons in these states were markedly over-represented in the clinic population. Similar differences were noted in the high-income-ratio states, but were less marked (Figure 3B). In fact, the percentage of white children in the clinic population was essentially the same as the percentage of white children in the total state populations.[1]

A comparison of years of schooling completed for the survey population and for the 1970 census shows two consistent findings (Figure 4). In each state it can be seen that the individuals in the survey population completed, on the average, fewer years of schooling than did the general population from the 1970 census. A second observation of importance is that the median school years completed, both in the survey population and in the 1970 census, was consistently lower in the states of South Carolina, Texas, Kentucky, Louisiana, and West Virginia than in the other states. These states also had a lower mean Poverty Income Ratio than did the other states in the survey. These figures suggest a relationship between lower income and fewer years of school completed.

[1] Similar comparisons for the individual states and New York City are presented in the Appendix, Tables 2A and 2B and Figures 1a through 1k.

Table 3A. *Comparison of the Age Distribution of Persons Attending and Not Attending Clinic by State (All Ethnic Groups)—Ten-State Nutrition Survey (1968-1970)*

State	Total		Age Group (Percent Distribution)														
	Number	Percent	<1	1	2	3	4	5	6-9	10-12	13-16	17-19	20-24	25-34	35-44	45-54	55-59	>59
Total																		
Attending	40723	100.0	2.1	2.5	2.7	2.9	3.2	3.2	14.5	10.6	10.3	4.0	5.2	9.3	8.3	7.4	3.3	10.4
Not Attending	44415	100.0	2.2	2.2	2.1	2.0	2.0	2.0	7.8	5.9	9.2	7.6	9.6	12.0	10.7	9.4	4.0	11.4
California																		
Attending	6075	100.0	1.9	2.6	2.5	3.0	3.2	3.2	14.5	9.8	8.9	3.3	6.1	11.2	8.8	7.8	2.9	10.4
Not Attending	7389	100.0	2.6	2.2	2.3	1.9	2.0	1.8	6.8	5.1	8.8	7.1	10.5	13.2	10.7	8.6	4.3	12.0
Kentucky																		
Attending	1646	100.0	1.8	2.4	2.3	2.6	3.4	2.9	13.4	10.6	9.0	3.0	3.6	8.3	8.6	9.4	4.3	14.6
Not Attending	2274	100.0	1.5	1.2	2.2	2.0	1.7	2.2	8.2	6.1	9.9	6.8	6.8	11.1	11.7	10.4	5.0	13.1
Louisiana																		
Attending	4917	100.0	2.3	2.3	3.2	2.8	3.4	3.2	14.2	11.3	11.4	4.3	3.6	7.8	7.5	7.4	3.6	11.5
Not Attending	2513	100.0	2.1	1.6	1.4	1.2	1.7	2.1	6.7	5.7	9.7	9.5	10.1	11.3	11.1	10.7	4.5	10.7
Massachusetts																		
Attending	4374	100.0	1.9	2.7	2.3	2.3	2.7	2.7	14.9	10.8	9.1	4.0	7.3	10.7	9.9	7.9	3.1	7.9
Not Attending	6175	100.0	2.0	2.6	2.3	2.4	2.0	2.3	8.3	6.2	8.7	7.4	10.1	12.5	10.4	9.2	3.7	9.8
Michigan																		
Attending	2357	100.0	1.5	2.5	2.8	2.7	3.2	3.3	16.4	13.2	10.9	2.7	3.7	7.9	8.0	7.0	3.0	11.3
Not Attending	3972	100.0	2.6	2.1	2.7	2.2	2.6	2.2	8.9	7.0	9.1	7.0	8.4	11.4	10.6	9.2	3.6	10.2
New York City																		
Attending	1972	100.0	2.1	2.4	2.3	3.2	3.3	3.1	13.2	9.6	10.6	4.4	6.1	12.6	9.3	8.2	2.7	6.8
Not Attending	2808	100.0	2.7	2.7	1.9	2.2	2.5	2.8	9.8	6.2	9.1	7.5	9.2	13.8	11.1	7.9	3.2	7.3
New York State																		
Attending	3202	100.0	1.9	2.2	2.6	2.4	2.2	2.8	12.2	9.2	8.1	3.8	4.8	10.1	10.0	11.2	4.1	12.3
Not Attending	3692	100.0	2.0	2.2	1.7	2.0	1.9	1.6	7.3	5.0	7.4	6.3	9.3	11.1	10.9	10.5	4.6	16.1
South Carolina																		
Attending	4762	100.0	2.4	2.9	3.2	3.6	4.1	4.1	16.0	12.3	14.2	5.1	3.9	6.4	6.3	5.7	2.8	7.1
Not Attending	4724	100.0	2.3	2.1	1.9	1.6	1.9	2.1	7.3	6.4	9.7	9.2	9.7	9.8	9.1	10.1	4.4	12.3
Texas																		
Attending	4460	100.0	2.5	2.7	2.8	3.3	3.6	3.4	16.4	11.3	12.0	4.3	3.3	6.3	8.0	6.3	3.4	10.4
Not Attending	3561	100.0	2.2	2.3	1.8	2.0	2.2	2.0	8.4	6.7	10.3	8.2	8.5	11.1	12.0	8.8	3.3	10.2
Washington																		
Attending	5331	100.0	2.2	2.1	2.7	3.1	3.2	3.0	13.7	9.0	8.7	4.7	7.6	11.8	7.2	6.1	3.1	11.9
Not Attending	3769	100.0	2.0	1.9	2.4	1.7	1.6	1.7	6.9	4.9	8.7	7.9	12.0	14.0	10.4	9.2	3.4	11.3
West Virginia																		
Attending	1627	100.0	2.1	2.1	2.3	3.0	3.2	3.1	12.8	8.8	9.4	3.5	4.2	8.7	9.4	8.3	5.0	14.2
Not Attending	3538	100.0	1.6	2.1	1.9	1.9	1.8	1.8	8.1	6.5	10.3	7.1	8.4	11.4	10.5	9.6	4.5	12.4

Although the makeup of the populations attending and not attending clinics was not different, the differences between the examined populations attending clinics and the total state populations make it clear that survey findings should not be interpreted or projected beyond the survey samples to the populations of those states from which the samples were selected. For this reason, in later sections of this report, evaluations and interpretations of survey data have been made primarily on the basis of comparisons within the examined population.

The division of the total sample into two categories, or sub-samples, was made to permit valid comparisons and evaluation of findings between the two groups. The basis for such a division is outlined in the following paragraphs.

SOCIOECONOMIC STATUS OF FAMILIES

During the interviews conducted as a part of the Ten-State Nutrition Survey, information was obtained about the annual income of participating families. Additional information relative to family size, the sex of the family head, and the place

Table 3B. *Comparison of the Age Distribution of Volunteers*[1] *Attending and Not Attending Clinic by State (All Ethnic Groups)—Ten-State Nutrition Survey (1968-1970)*

State	Total		Age Group (Percent Distribution)					
	Number	Percent	<6	6-9	10-16	17-44	45-59	>59
Total								
Attending	8228	100.0	17.4	16.3	20.8	28.0	8.5	9.0
Not Attending	5942	100.0	14.3	8.5	18.0	41.7	10.4	7.2
California								
Attending	2026	100.0	20.8	18.2	19.3	28.5	6.9	6.3
Not Attending	701	100.0	10.3	4.9	17.1	49.1	10.3	8.4
Kentucky								
Attending	17	100.0	0.0	0.0	0.0	82.4	0.0	17.6
Not Attending	6	100.0	0.0	0.0	0.0	50.0	33.3	16.7
Louisiana								
Attending	1592	100.0	14.9	14.8	27.4	23.4	11.1	8.2
Not Attending	555	100.0	7.7	5.6	20.4	43.2	13.3	9.7
Massachusetts								
Attending	447	100.0	13.2	26.0	23.7	32.2	4.0	0.9
Not Attending	912	100.0	23.7	13.8	20.7	37.1	3.9	0.8
Michigan								
Attending	568	100.0	17.3	17.3	23.1	22.9	8.8	10.7
Not Attending	996	100.0	15.6	9.4	17.9	39.3	10.4	7.4
New York City								
Attending	148	100.0	25.0	17.6	8.8	25.7	6.8	16.2
Not Attending	121	100.0	15.7	8.3	14.0	45.5	9.1	7.4
New York State								
Attending	—	—	—	—	—	—	—	—
Not Attending	—	—	—	—	—	—	—	—
South Carolina								
Attending	141	100.0	10.6	15.6	28.4	19.9	13.5	12.1
Not Attending	80	100.0	11.3	10.0	16.3	33.8	21.3	7.5
Texas								
Attending	257	100.0	23.0	19.8	33.1	19.8	3.5	0.8
Not Attending	153	100.0	12.4	10.5	27.5	38.6	8.5	2.6
Washington								
Attending	2403	100.0	16.3	13.8	16.1	32.1	8.2	13.5
Not Attending	1413	100.0	11.7	6.2	12.8	46.1	12.7	10.4
West Virginia								
Attending	629	100.0	17.6	14.8	19.4	27.5	12.6	8.1
Not Attending	1005	100.0	14.8	9.8	21.6	36.4	10.9	6.5

[1] Volunteers are all persons who were not selected as part of the original sample.

of residence, e.g., farm or nonfarm, was also obtained. All of these data were then employed to determine the Poverty Income Ratio (PIR) for each family. For this purpose, the weighted averages of incomes at poverty level, as proposed by Orshansky,[1] were employed.

As shown in Table 6 and Figure 5, the annual income considered to be the poverty level increases with an increase in family size. Obviously a given income would be less nearly adequate for a large family than it would be for a small family. Orshansky's classification also shows that an income considered to be at the poverty level for a nonfarm family of a given size would be above poverty level for a farm family of equal size. The sex of the head of the family appears to have only a small effect on the poverty-level income.

A family with any combination of characteristics set forth in Table 6 and with the corresponding income has arbitrarily been designated as having a PIR of 1.0. That same family, with twice the income indicated in the table, would have a PIR of 2.0.

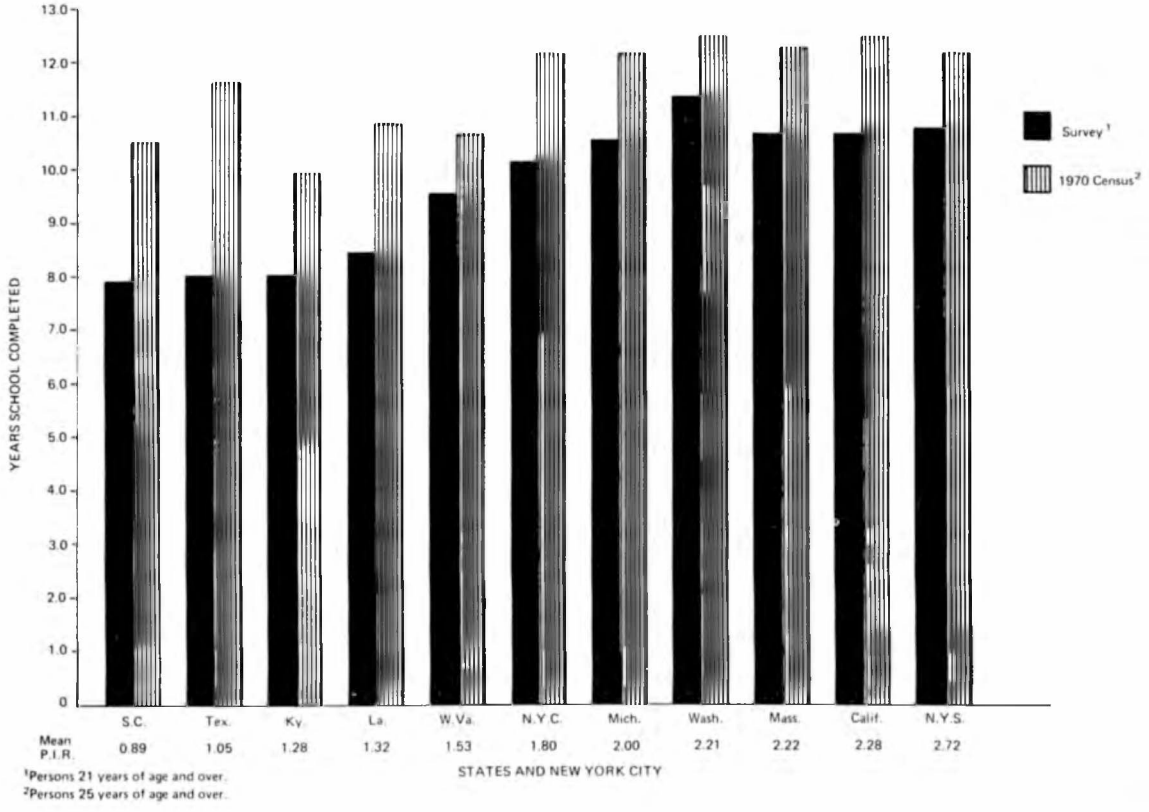
[1] Orshansky, M.: The Shape of Poverty in 1966. *Social Security Bulletin*, March 1968.

To illustrate this, consider a four-member nonfarm family with a male head-of-household having an annual income of $6,670 rather than the $3,335 given in the table. This family would have a PIR of 2.0, i.e., $6,670 divided by $3,335. A family with the same characteristics but with an annual income of $2,000 would have a PIR value of 0.60 ($2,000 divided by $3,335). If this were a farm family with four members, a male head, and $2,000 annual income, the PIR value would be 0.85 ($2,000 divided by $2,345).

Ratios of less than 1.0 can therefore be described as "below poverty"; ratios greater than 1.0, as "above poverty." A family with a PIR of 1.0 is living at the poverty line. Though the designation of a family as farm or nonfarm was used in the calculation of the PIR value for a family, the number of farm individuals attending clinics (7.2 percent of the clinic population) was so small that in all presentations of data, farm and nonfarm individuals have been grouped together.

Income Ratio of States. The mean or average poverty income ratio for all families for whom income data were available was 1.89 (Table 7).

Figure 1—Median School Years Completed by State for Survey and for 1970 Census—Ten-State Nutrition Survey (1968-1970)



Mean PIR values ranged from 0.89 for South Carolina to 2.72 for New York State. In only one state, South Carolina, was the mean PIR less than 1.0 or "below poverty." However, the median values for PIR (the value below which and above which there is an equal number of families) show that in four states (South Carolina, Louisiana, Texas, and Kentucky) more than half of the families had incomes that gave them a PIR of less than 1.0 (Table 7).

The areas surveyed have been divided into two groups of states to permit comparison and evaluation while maintaining large enough groups to make those comparisons valid. The division was made primarily on the basis of median PIR. States with a median PIR below the overall median value of 1.39 were designated as "low-income-ratio" states. This group of states included South Carolina, Louisiana, Texas, Kentucky, and West Virginia. States with a median PIR equal to or greater than the overall median were designated "high-income-ratio" states. This group included Michigan, California, Washington, Massachusetts, New York State, and New York City..

Table 4. *Comparison of the Years of School Completed for Persons Twenty-One Years of Age and Over Attending and Not Attending Clinic by State—Ten-State Nutrition Survey (1968-1970)*

State	Total		Years of School Attended (Percent Distribution)							
	Number	Percent	None	<5 Yrs.	5-8 Yrs.	9-12 Yrs.	Post H.S.	College	Other	Unknown
Total										
Attending	17458	100.0	3.8	10.3	26.7	40.8	3.4	12.4	0.1	2.6
Not Attending	24347	100.0	3.2	7.6	26.6	44.8	2.8	10.3	0.2	4.5
California										
Attending	2807	100.0	3.7	10.5	21.1	38.8	3.0	19.6	0.0 [1]	3.2
Not Attending	4225	100.0	2.9	6.9	20.2	47.0	2.7	15.7	0.0 [1]	4.5
Kentucky										
Attending	783	100.0	2.4	15.6	42.5	28.2	1.0	5.5	0.4	4.3
Not Attending	1283	100.0	2.5	11.0	43.9	27.1	1.0	5.1	0.5	8.9
Louisiana										
Attending	1998	100.0	5.7	16.9	34.1	31.2	8.0	0.0	0.0	4.2
Not Attending	1402	100.0	4.7	12.3	33.1	36.7	8.6	0.0	0.0	4.6
Massachusetts										
Attending	1997	100.0	3.8	6.1	18.9	47.6	3.7	17.1	0.4	2.5
Not Attending	3302	100.0	2.7	5.1	20.7	51.0	4.2	12.3	0.3	3.8
Michigan										
Attending	951	100.0	0.4	5.2	25.7	50.6	3.3	13.5	0.0	1.5
Not Attending	2051	100.0	1.1	4.0	23.2	56.1	2.2	9.6	0.3	3.5
New York City										
Attending	877	100.0	4.1	10.1	26.7	43.7	2.5	12.1	0.3	0.5
Not Attending	1418	100.0	3.1	6.4	24.8	48.8	2.5	12.1	0.5	1.8
New York State										
Attending	1657	100.0	0.7	3.2	24.9	51.1	4.5	13.9	0.1	1.6
Not Attending	2227	100.0	0.8	2.9	25.4	53.7	3.3	10.0	0.6	3.3
South Carolina										
Attending	1484	100.0	4.8	20.8	36.7	34.8	0.5	1.5	0.0	1.0
Not Attending	2492	100.0	4.9	15.8	34.3	36.9	0.8	3.9	0.3	3.2
Texas										
Attending	1651	100.0	11.6	19.6	28.7	30.3	0.0	5.3	0.0	4.5
Not Attending	1844	100.0	9.8	12.9	26.5	36.3	0.0	6.1	0.0	8.4
Washington										
Attending	2455	100.0	0.7	1.8	17.8	50.6	4.6	22.3	0.0 [1]	2.0
Not Attending	2158	100.0	1.4	2.4	19.8	50.7	3.3	16.8	0.0	5.6
West Virginia										
Attending	798	100.0	1.9	6.0	38.6	35.6	1.8	12.9	0.3	3.0
Not Attending	1945	100.0	1.4	5.9	35.3	41.7	2.0	8.7	0.3	4.7

[1] Value less than 0.05.

Ethnic Composition and Income Ratio. In both groups of states the black and Spanish-American populations had a larger percentage of families in low PIR groups than did the white population. Conversely, the white population had a higher percentage in the upper PIR groups (Table 8).[1] Figure 6, a graphic presentation of the data summarized in Table 8, shows the concentration of black and Spanish-American families in the lower PIR groups. It also shows that more survey families, regardless of ethnic background, were in low PIR groups than in high PIR groups.

[1] Appendix, Table 3, gives complete data for the Poverty-Income-Ratio distribution for all ethnic groups, including Oriental and American-Indian populations.

The breakdown by PIR group, for white families and for black, as shown in Figures 7a and 7b, further emphasizes the difference between the two categories of states, a difference already described in terms of the mean and median PIR values.

The Spanish-American population was well represented only in New York City, Massachusetts, Texas, California, and Washington. Texas had the highest concentration of Spanish-American families with a low PIR (less than 1.0) and the lowest concentration with PIR levels of 1.0 and above (Figure 7c). The Spanish-American populations in Massachusetts and New York City showed a distribution by PIR level similar to that of the Spanish-Americans in California and Washington.

Table 5. *Comparison of Income for Families Attending and Not Attending Clinic by State (All Ethnic Groups)—Ten-State Nutrition Survey (1968-1970)*

State	Total Number of Families	Income Groups (Percent Distribution)						
		$0-1999	$2000-3999	$4000-5999	$6000-7999	$8000-9999	$10000-11999	$12000-+
California								
Attending	1793	12.3	26.2	21.1	16.6	9.2	5.2	9.2
Not Attending	421	16.1	26.6	15.9	16.1	9.0	5.2	10.9
Kentucky								
Attending	538	37.0	33.4	12.4	10.2	4.5	0.9	1.5
Not Attending	5	Insufficient number to compare						
Louisiana								
Attending	964	38.7	29.9	13.1	7.0	4.5	2.8	4.0
Not Attending	4	Insufficient number to compare						
Massachusetts								
Attending	1462	11.3	20.4	18.6	17.9	12.5	7.9	11.2
Not Attending	173	29.5	25.4	15.6	12.7	5.8	4.6	6.3
Michigan								
Attending	670	19.6	19.0	19.6	15.4	10.3	7.2	9.1
Not Attending	738	17.3	19.9	14.9	19.8	13.1	7.2	7.7
New York City								
Attending	613	15.8	28.9	29.8	15.5	5.7	1.8	2.4
Not Attending	579	13.8	31.3	27.3	14.8	6.2	2.8	3.8
New York State								
Attending	1031	12.8	18.0	17.7	16.6	13.5	8.3	13.0
Not Attending	11	Insufficient number to compare						
South Carolina								
Attending	1056	45.8	34.4	14.1	2.8	2.1	0.5	0.3
Not Attending	45	42.2	33.3	6.7	6.7	2.2	0.0	8.8
Texas								
Attending	994	31.9	40.3	15.5	5.9	3.4	1.3	1.6
Not Attending	—	—	—	—	—	—	—	—
Washington								
Attending	1745	23.8	17.7	13.5	15.3	11.4	8.1	10.1
Not Attending	89	27.0	14.6	13.5	6.7	11.2	11.2	15.7
West Virginia								
Attending	478	30.1	25.7	16.1	15.3	7.5	1.4	3.8
Not Attending	133	36.1	28.6	19.5	9.0	4.5	1.5	0.7

In both of these regions, the majority of the Spanish-American families had PIR values between 0.5 and 1.5.[1]

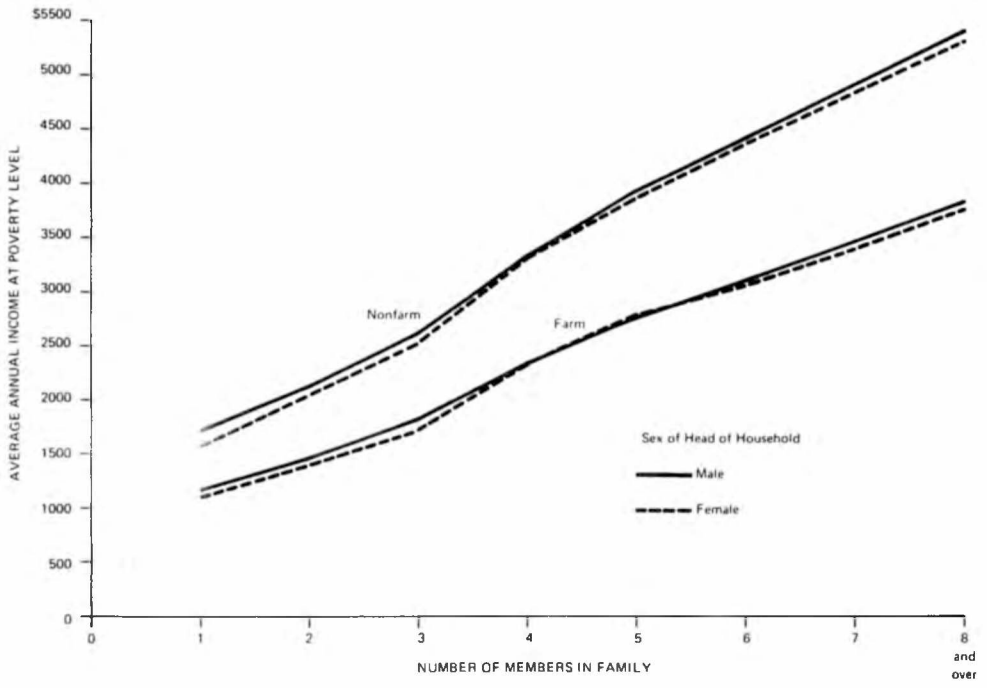
Effect of Family Size. Once the family size exceeded two to three persons, the mean Poverty Income Ratio for the survey families decreased with an increase in family size (Figure 8). Since family size is taken into account in deriving the PIR value, with a larger family having a lower PIR value for any given income, this observed decrease is over and beyond that resulting from increased family size. This finding was true for all ethnic groups. However, for any given family size, white families had the highest mean PIR value. The black and Spanish-American populations showed essentially the same PIR distribution in relation to the size of the family.

Housing. The average number of rooms per person generally increased with increasing PIR (Figures 9a and 9b). White families, except at PIR levels of 3 to 4, had more rooms per person than black or Spanish-American families had. At all PIR levels, in general the mean number of rooms per person was lower in the low-income-ratio states (Figure 9a) than in the high-income-ratio states (Figure 9b). Information such as that presented in Figures 9a and 9b, while not a direct measure of poverty, does reflect the fact that at low income levels there is less available living space per person, an indication of the crowding that is characteristic of poverty.

Years of School Completed. The level of educational attainment, as measured by the years of school completed by persons 21 years of age and over, was lower for the Spanish-American population than for either the black or the white populations (Figures 10a and 10b). This was true in both groups of states and at all PIR levels. In general, the years of school completed differed little between the white and the black populations in either group of states. At low PIR levels, both the white and black populations in the low-income-ratio states (Figure 10a) had much lower median values than did these ethnic groups in the high-income-ratio states (Figure 10b). The difference between the two groups of states, notable at low PIR levels, tended to become much less apparent at higher levels. In both groups of states there was a marked increase in the years of school completed by the Spanish-American population with an increase in PIR value. In the low-income-ratio states, there also tended to be an increase in the median level of school years completed among

[1] The distribution of families by Poverty-Income-Ratio value and by ethnic group for each of the ten states and New York City is shown in Figures 1a through 1k of the Appendix.

Figure 5—Weighted Average of Incomes at Poverty Level for Families of Different Composition by Family Size, Sex of Head and Farm or Nonfarm Residence, March 1967



Source: "The Shape of Poverty in 1966" by Mollie Orshansky.

Table 6. *Weighted Average of Poverty Criteria for Families of Different Composition, by Household Size, Sex of Head, and Farm or Nonfarm Residence, March 1967*

Number of Family Members	Weighted Average of Incomes at Poverty Level			
	Nonfarm		Farm	
	Male Head	Female Head	Male Head	Female Head
1 Member	$1710	$1595	$1180	$1110
Head under age 65	1760	1625	1230	1140
Head age 65+	1580	1560	1105	1090
2 Members	2130	2055	1480	1400
Head under age 65	2200	2105	1540	1465
Head age 65+	1975	1955	1380	1370
3 Members	2610	2515	1820	1725
4 Members	$3335	$3320	$2345	$2320
5 Members	3930	3895	2755	2775
6 Members	4410	4395	3090	3075
7 Members	4822	4761	3372	3349
8 Members	5131	5035	3583	3555
9+ Members	5337	5218	3724	3692

Source: Orshansky M.: The Shape of Poverty in 1966. Social Security Bulletin, March 1968.

whites and blacks in association with an increase in PIR value.

In the high-income-ratio states there appeared to be no significant relationship between the years of school completed and the PIR value except among Spanish-Americans. The median educational level of the white and black populations, even of those in the lowest PIR group (PIR less than 0.5), was essentially equal to the median for the total sample population. The median number of years of school completed by these two ethnic groups was nearly 10 years (or greater) at all PIR levels.

In marked contrast, in the lowest PIR value group, the median values of Spanish-Americans for years of school completed was 4.7 and 4.3 years, respectively, in the low- and high-income-ratio states. The findings with respect to the Spanish-American population may be a reflection of recent migration to the areas in which they were residing at the time of the survey.

FAMILY MAKEUP

Heads of Families. Overall in the study populations, approximately 70 percent of the families were headed by males (Figure 11). About 75 percent of the white families were headed by males, compared to approximately 60 percent of the black families. There were relatively few Oriental families in the total sample population, but 90 percent of them were headed by males.

Figure 6—Distribution of Families by Ethnic Group and Poverty Income Ratio Group for Low and High Income Ratio States—Ten-State Nutrition Survey (1968-1970)

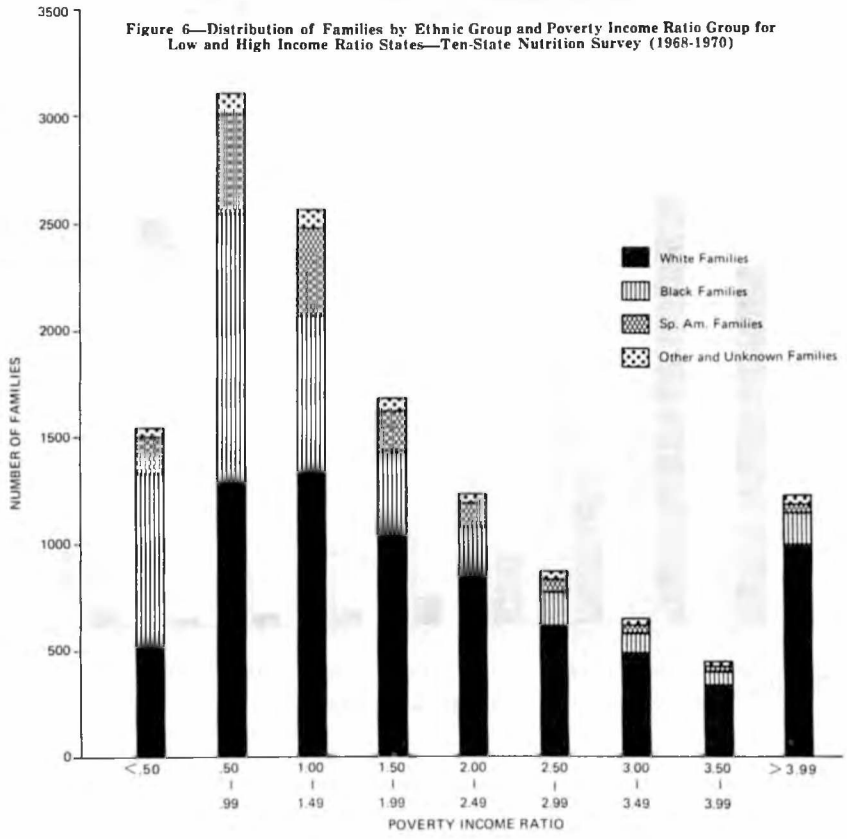


Figure 7a—Percentage Distribution of White Families by Poverty Income Ratio in Low Income Ratio States and High Income Ratio States—Ten-State Nutrition Survey (1968-1970)

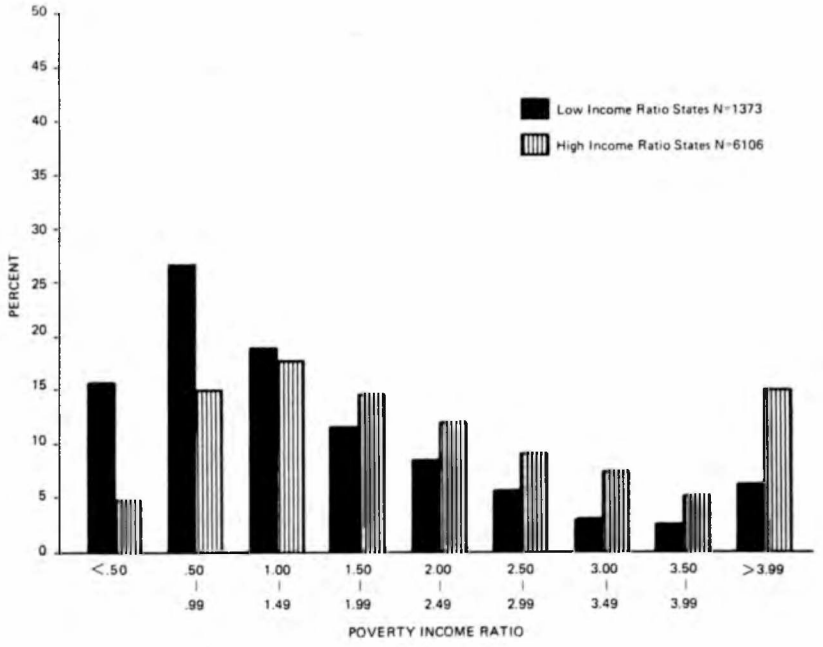


Figure 7b—Percentage Distribution of Black Families by Poverty Income Ratio for Low Income Ratio States and High Income Ratio States—Ten-State Nutrition Survey (1968-1970)

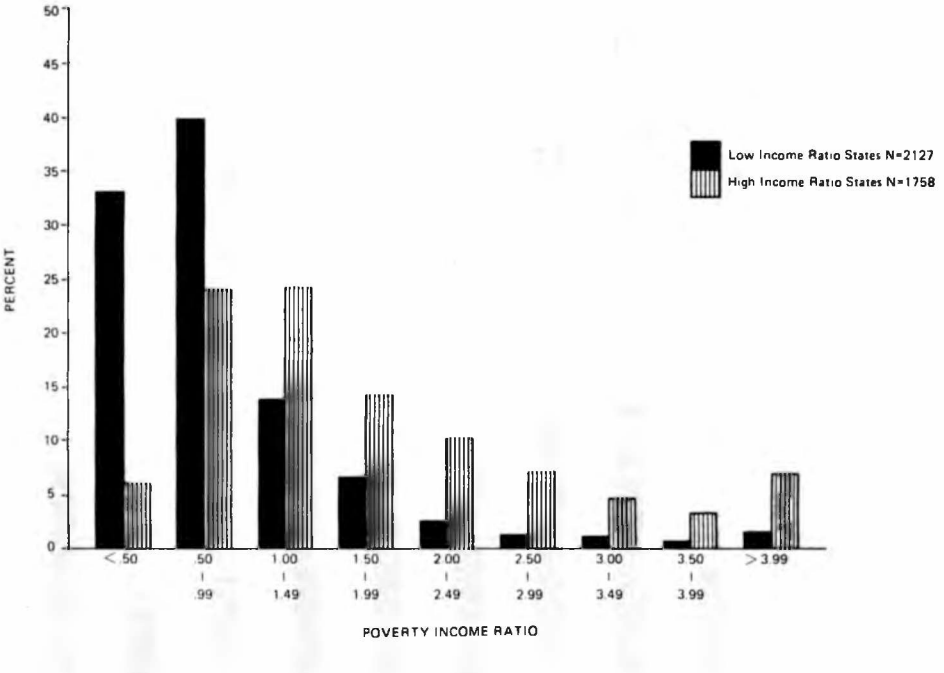


Figure 7c—Percentage Distribution of Spanish American Families by Poverty Income Ratio in Selected Survey Sites—Ten-State Nutrition Survey (1968-1970)

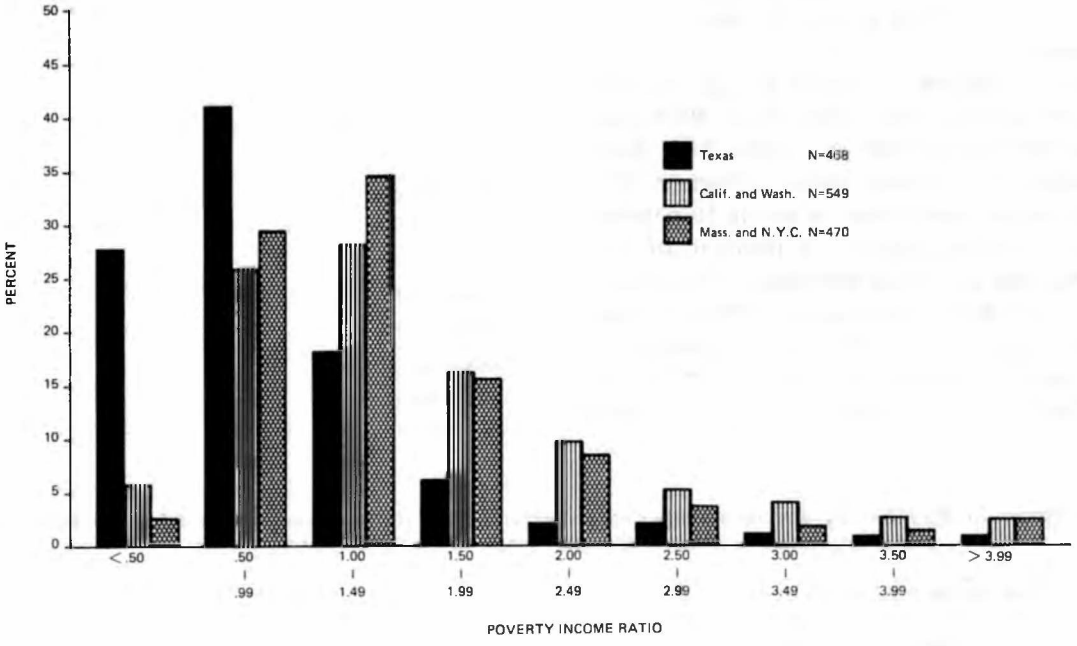
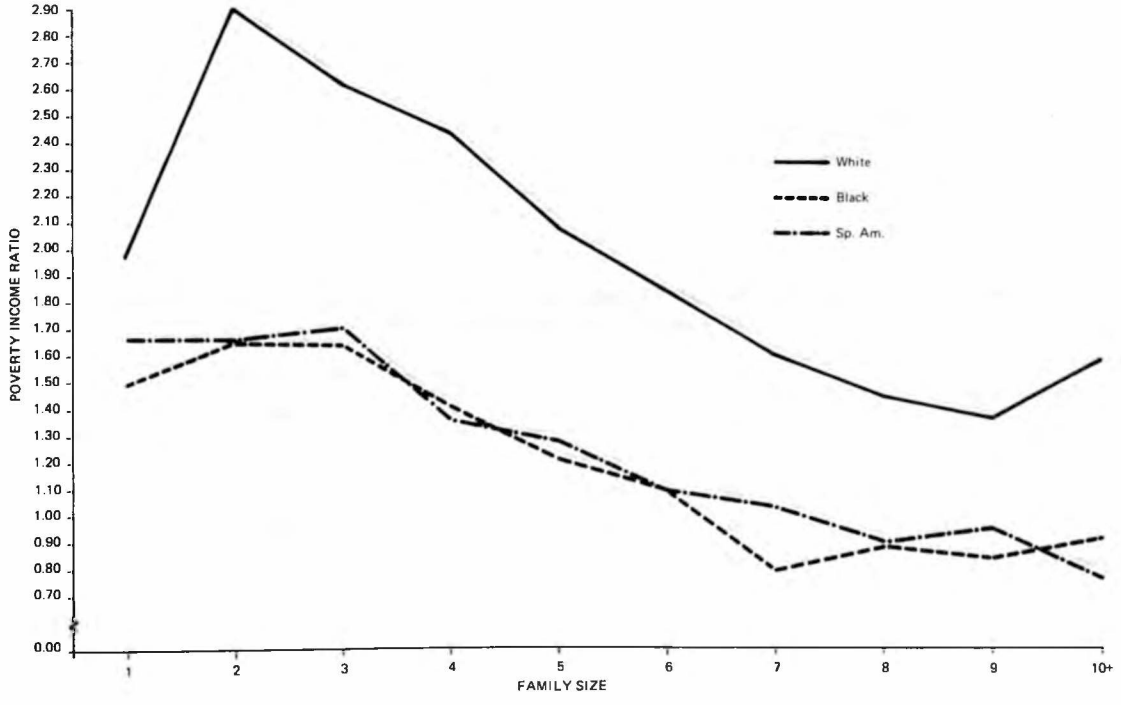


Figure 8—Mean Poverty Income Ratio by Family Size for White, Black and Spanish American Families—Ten-State Nutrition Survey (1968-1970)



There was little difference between the two categories of states in terms of the sex of heads of families except for the Spanish-American families. For this ethnic group, about 80 percent of families in low-income-ratio states but only about 67 percent in the high-income-ratio states were headed by males.

Number of Children. In terms of the number of children per family, there was little difference between the two categories of states, but there were differences by ethnic group (Figure 12). Overall, there were no children in about 50 percent of the white families, about 33 percent of the black families, and about 25 percent of the Spanish-American families. Conversely, three or more children were present in a higher percentage of black and Spanish-American families than in white families. In both groups of states, larger

Table 7. *Mean and Median Poverty Income Ratios by State—Ten-State Nutrition Survey (1968-1970)*

State	Poverty Income Ratio	
	Mean	Median
Total	1.89	1.39
South Carolina	0.89	0.67
Texas	1.05	0.84
Kentucky	1.28	0.94
Louisiana	1.32	0.79
West Virginia	1.53	1.17
New York City	1.80	1.39
Michigan	2.00	1.66
Washington	2.21	1.74
Massachusetts	2.22	1.74
California	2.28	1.71
New York State	2.72	2.16

Table 8. *Distribution of Families by Ethnic Group and Poverty Income Ratio Group for Low Income Ratio States and High Income Ratio States—Ten-State Nutrition Survey (1968-1970)*

Poverty Income Ratio	LOW INCOME RATIO STATES						HIGH INCOME RATIO STATES							
	White		Black		Spanish American Texas		White		Black		Spanish American N.Y.C. & Mass.		Spanish American Calif. & Wash.	
	Number	Percent	Number	Percent	Number	Percent	Number	cent Per-	Number	Percent	Number	Percent	Number	Percent
Total	1373	100.0	2127	100.0	468	100.0	6106	100.0	1758	100.0	470	100.0	549	100.0
.00-.49	225	16.4	702	33.0	130	27.8	291	4.8	105	6.0	13	2.8	32	5.8
.50-.99	370	26.9	843	39.6	192	41.0	912	14.9	416	23.7	138	29.4	141	25.7
1.00-1.49	264	19.2	296	13.9	85	18.2	1079	17.7	428	24.3	162	34.5	154	28.1
1.50-1.99	159	11.6	143	6.7	29	6.2	881	14.4	249	14.2	73	15.5	89	16.2
2.00-2.49	119	8.7	53	2.5	10	2.1	729	11.9	180	10.2	39	8.3	54	9.8
2.50-2.99	78	5.7	28	1.3	10	2.1	551	9.0	124	7.1	18	3.8	29	5.3
3.00-3.49	42	3.1	20	0.9	4	0.9	449	7.4	81	4.6	9	1.9	22	4.0
3.50-3.99	31	2.3	12	0.6	4	0.9	312	5.1	54	3.1	7	1.5	15	2.7
4.00+	85	6.2	30	1.4	4	0.9	902	14.8	121	6.9	11	2.3	13	2.4

Table 9A. *Age and Ethnic Group Distribution of Pregnant or Lactating Females for Low Income Ratio States—Ten-State Nutrition Survey (1968-1970)*

Ethnic Group	Age Group (Years of Age)							
	Total	<13	13-16	17-19	20-24	25-34	35-44	>44
Total	167	0	8	30	40	67	22	0
White	23	0	2	0	8	11	2	0
Black	97	0	5	22	18	42	10	0
Spanish American	45	0	1	7	13	14	10	0
Oriental	—	—	—	—	—	—	—	—
American Indian	—	—	—	—	—	—	—	—
Unknown	2	0	0	1	1	0	0	0

families were more characteristic of black and Spanish-American populations than of white populations.[1]

Pregnant or Lactating Females. Both pregnancy and lactation are stress conditions that increase the body's requirements for many nutrients and may result in changed dietary habits. In any assessment of nutritional status, therefore, information must be available on the number of pregnant and lactating females and their distribution within different age, ethnic, and income groups. This is especially true in the evaluation and interpretation of data obtained through clinical examinations.

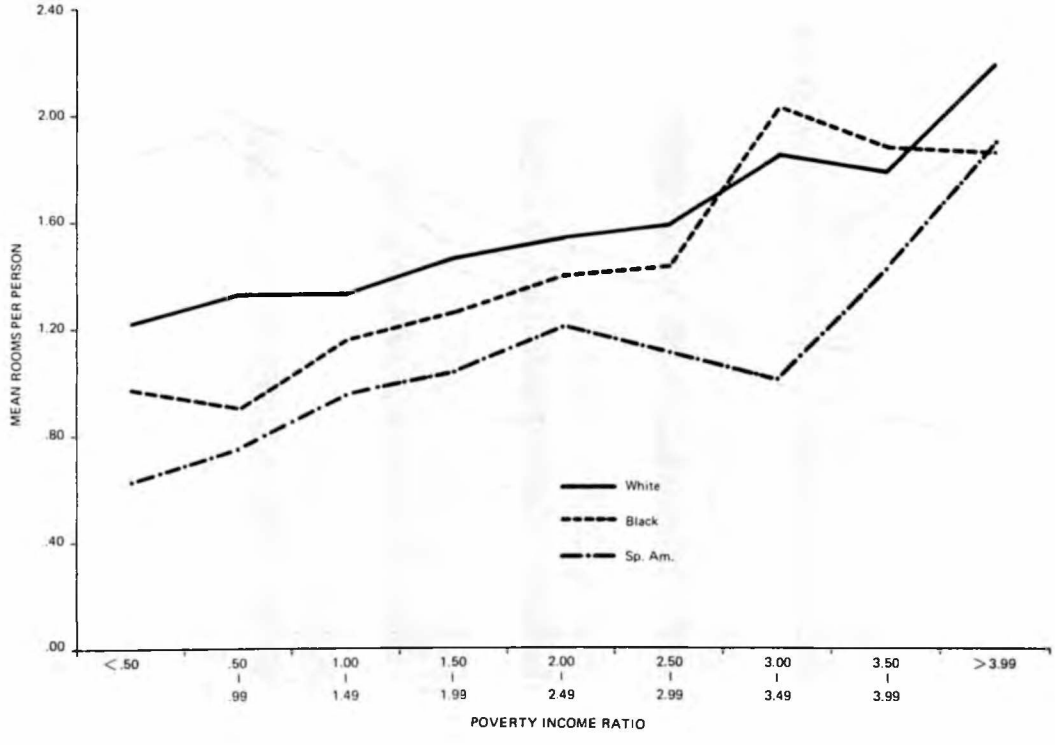
In the survey, 615 women were identified in the interview as either pregnant or lactating (Tables 9A and 9B). Since only a very small number of these women were lactating, they were all considered as a single group for purposes of analysis.

[1] Appendix Tables 4A and 4B show the distribution of families by number of persons less than 17 years of age, and by ethnic group, for both groups of states.

Table 9B. *Age and Ethnic Group Distribution of Pregnant or Lactating Females for High Income Ratio States—Ten-State Nutrition Survey (1968-1970)*

Ethnic Group	Age Group (Years of Age)							
	Total	<13	13-16	17-19	20-24	25-34	35-44	>44
Total	448	0	19	64	147	177	36	5
White	284	0	7	29	74	104	17	3
Black	119	0	10	24	43	31	10	1
Spanish American	63	0	0	7	22	25	8	1
Oriental	13	0	0	0	1	11	1	0
American Indian	14	0	1	3	7	3	0	0
Unknown	5	0	1	1	0	3	0	0

Figure 9a—Distribution of Mean Rooms per Person by Poverty Income Ratio for White, Black and Spanish American Persons for Low Income Ratio States—Ten-State Nutrition Survey (1968-1970)



There were 167 pregnant or lactating females in the low-income-ratio states and 448 in the high-income-ratio states. In both groups of states the major proportion of these females were between 20 and 34 years of age; approximately one-fifth of the total in both groups of states were teen-age girls (13 to 19 years). In the low-income-ratio states more than one-half of the pregnant or lactating females were black individuals. In the high-income-ratio states more than one-half of the total were white females.

SUMMARY

The negative effect of poverty on nutritional status has long been emphasized. For this reason, the sampling procedure of the Ten-State Nutrition Survey was designed to select a low-income population. The demographic data summarized in this section demonstrate that the survey population was, in fact, composed largely of low-income families. Both the mean and median values for the Poverty Income Ratio varied widely from state to state. However, a large proportion of the families included in the survey were living below or only slightly above the poverty level. A consideration of the income data also made it clear that the ten states, and New York City, included in the survey could be divided into two large subsamples. In one group, identified as low-income-ratio states, more than half of the families were living at a "below-poverty" level. In the second group of states, the high-income-ratio states, more than half of the families were classified as living "above poverty."

The demographic data also gave evidence of other differences between the two groups of states. The median years of school completed was lower in the low-income-ratio states. The distribution of families by ethnic group varied widely from state to state, but generally, there were more black families in the low-income-ratio states, both in terms of total numbers and in terms of percentage of the population. On the other hand, there was no significant difference between the groups of states with respect to the age and sex distribution of their populations.

Figure 9b—Distribution of Mean Rooms per Person by Poverty Income Ratio for White, Black and Spanish American Persons for High Income Ratio States—Ten-State Nutrition Survey (1968-1970)

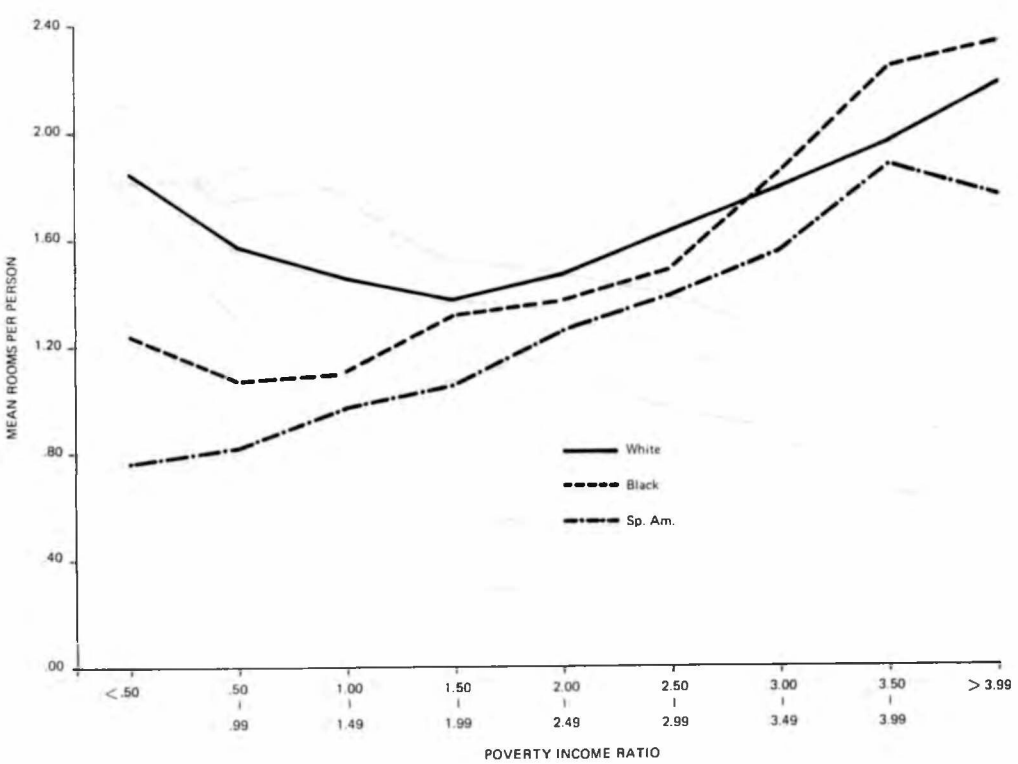


Figure 10a—Median Years of School Completed by Poverty Income Ratio and Ethnic Group for Low Income Ratio States—Ten-State Nutrition Survey (1968-1970)

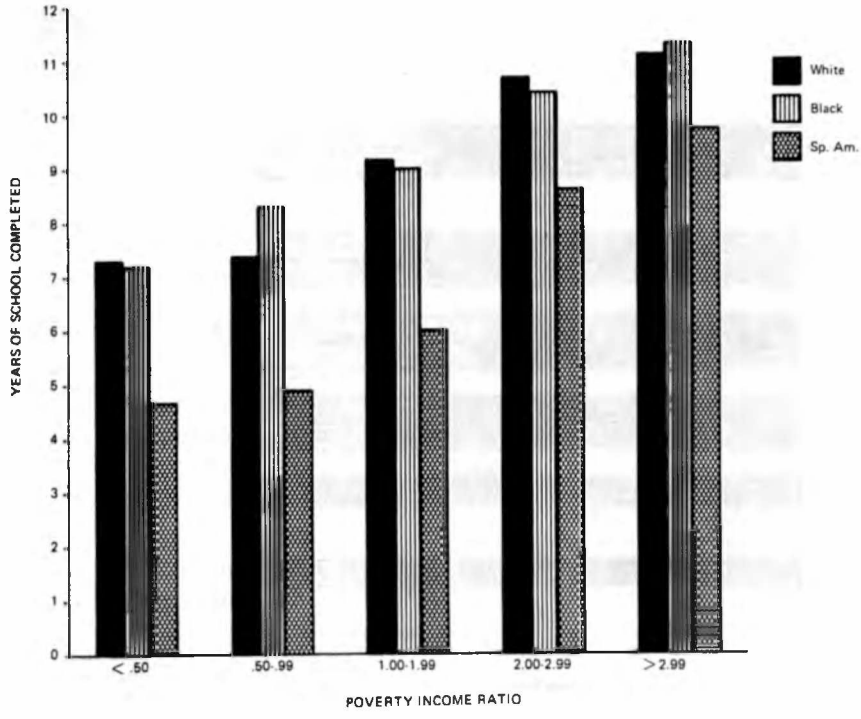


Figure 10b—Median Years of School Completed by Poverty Income Ratio and Ethnic Group for High Income Ratio States—Ten-State Nutrition Survey (1968-1970)

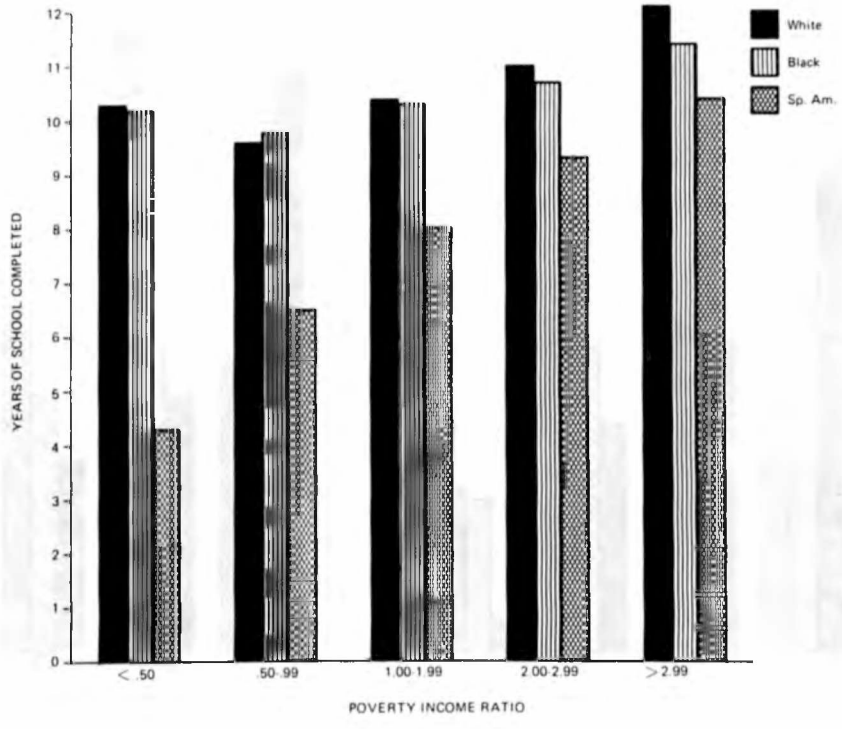


Figure 11—Percentage Sex Composition of Heads of Families with Known Poverty Income Ratio by Ethnic Group for Low Income Ratio States and High Income Ratio States—Ten-State Nutrition Survey (1968-1970)

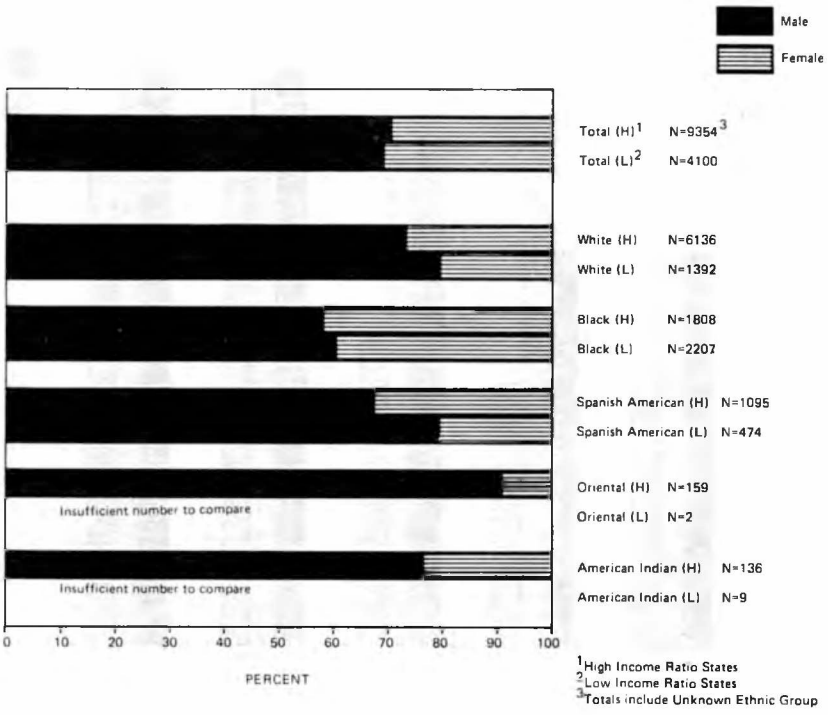
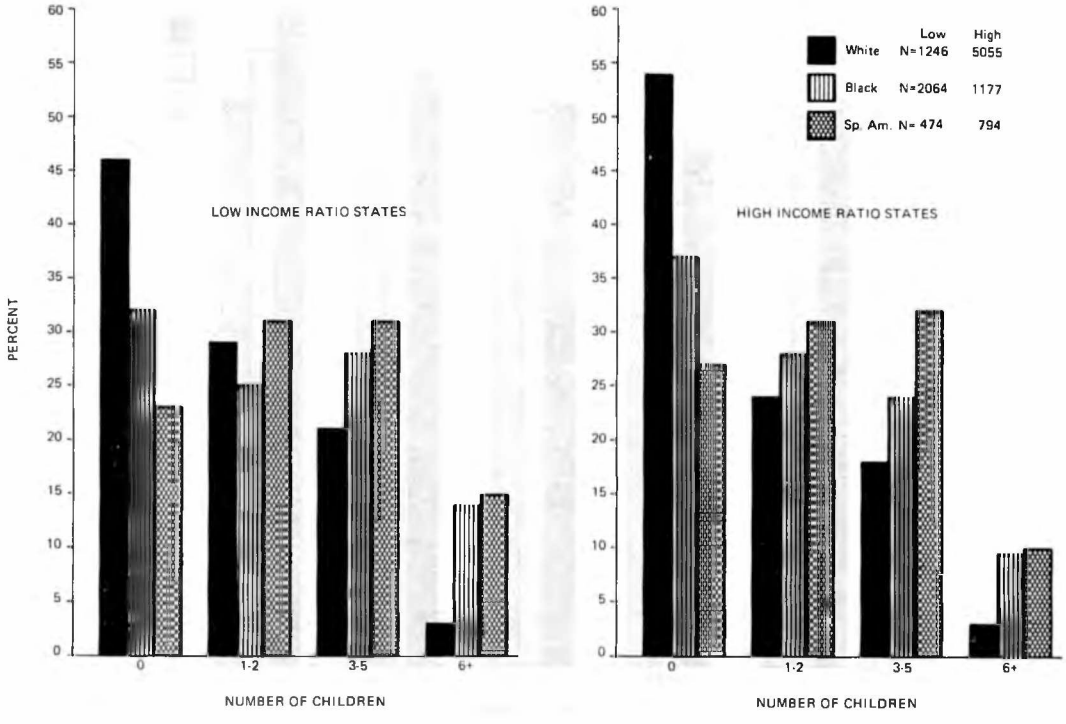


Figure 12—Percentage Distribution of Number of Children per Family for Low Income Ratio States and High Income Ratio States—Ten-State Nutrition Survey (1968-1970)



There were some differences between the populations that attended clinics and the populations that did not attend. The most striking difference was in the age distribution of the clinic versus the non-clinic populations. Children were over-represented in the clinic populations, and older persons were under-represented. This difference must be considered when interpreting the clinical, anthropometric, and biochemical data, many of which are age dependent. However, within-group and between-group comparisons can be expected to provide meaningful information relative to nutritional status and to factors influencing such status. The data also demonstrated that there were few and not very striking differences between the so-called "volunteer" families and the total survey population. This finding supports the inclusion of volunteer families in the analysis of data obtained from the clinic populations.

A comparison of the survey populations with the total populations of the states from which the samples were selected (characteristics of the latter obtained from data collected for the 1960 and 1970 census) showed considerable disparity between the two groups. This was especially true for the age distribution and the ethnic composition of the survey population attending clinics as compared with the total state populations. Since the survey was designed to select a low-income population, there would obviously be a disparity in level of income between the survey population and the state populations. Because of these disparities the survey findings cannot be projected to or interpreted in terms of the total state populations.

While the survey was planned to select low-income families, it did include a number of families with fairly high Poverty Income Ratios. Mean and median PIR values for the two groups of states show that, particularly in the so-called high-income-ratio states, the survey included a number of families living "above poverty." Thus the data from the Ten-State Nutrition Survey affords the opportunity to analyze presumed developmental and growth restrictions and biochemical insufficiences in low-income families and individuals, while at the same time providing families and individuals with higher PIR values to serve as a within-sample reference. This latter point is especially important, since adequate norms and standards are non-existent for virtually all of the parameters being explored; and the basic question is whether, within the sample, those of lowest incomes relative to needs are the most affected, or whether, for matched-income-need groups, factors other than income-relative-to-need behave as independent variables.

APPENDIX

Demographic Data

Ten-State Nutrition Survey

Table 1A Appendix. *Comparison of the Age and Sex Distribution of Persons Attending Clinic with State Populations in 1960 and 1970 for Low Income Ratio States—Ten-State Nutrition Survey (1968-1970)*

Age Group	Total			Kentucky			Louisiana			South Carolina			Texas			West Virginia		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
TOTAL																		
Survey	100.0	44.9	55.3	100.0	43.7	56.3	100.0	56.6	43.6	100.0	42.6	57.3	100.0	42.1	57.8	100.0	41.3	58.6
1970 Census	100.0	49.2	50.7	100.0	49.2	51.1	100.0	48.7	51.2	100.0	49.1	50.9	100.0	48.8	51.0	100.0	48.3	51.6
1960 Census	100.0	49.3	50.6	100.0	49.5	50.2	100.0	48.9	51.1	100.0	49.3	50.5	100.0	49.7	50.5	100.0	49.3	50.8
<6 YEARS																		
Survey	16.5	8.5	8.0	15.4	8.6	6.8	10.1	5.2	4.9	18.5	10.1	8.4	18.4	9.0	9.4	15.6	7.2	8.4
1970 Census	10.8	5.5	5.3	10.4	5.3	5.1	11.8	6.0	5.8	11.1	5.6	5.5	10.8	5.5	5.3	9.7	5.0	4.7
1960 Census	14.4	7.3	7.1	13.5	6.9	6.6	15.6	7.9	7.7	14.8	7.5	7.3	14.5	7.4	7.1	12.7	6.5	6.2
6-9 YEARS																		
Survey	14.1	7.2	6.9	13.4	6.5	6.9	6.8	3.4	3.4	16.3	8.1	8.2	16.3	8.4	7.9	12.8	7.3	5.5
1970 Census	8.2	4.2	4.0	8.0	4.1	3.9	8.7	4.4	4.3	8.4	4.3	4.1	8.3	4.2	4.1	7.3	3.7	3.6
1960 Census	8.9	4.5	4.4	8.5	4.3	4.2	9.3	4.7	4.6	9.5	4.8	4.7	8.9	4.5	4.4	8.6	4.4	4.2
10-12 YEARS																		
Survey	10.4	5.3	5.1	10.6	5.9	4.7	5.6	3.0	2.6	12.6	5.7	6.9	11.3	6.1	5.2	8.8	4.6	4.2
1970 Census	6.3	3.2	3.1	6.3	3.2	3.1	6.9	3.5	3.4	6.5	3.3	3.2	6.3	3.2	3.1	6.1	3.1	3.0
1960 Census	6.3	3.2	3.1	6.3	3.2	3.1	6.5	3.3	3.2	7.0	3.6	3.4	6.1	3.1	3.0	6.7	3.4	3.3
13-16 YEARS																		
Survey	11.8	5.8	6.0	9.0	4.2	4.8	9.7	5.4	4.3	14.5	7.4	7.1	12.0	5.2	6.8	9.4	4.7	4.7
1970 Census	8.3	4.2	4.1	8.2	4.2	4.0	8.7	4.4	4.3	8.7	4.4	4.3	8.2	4.2	4.0	8.2	4.2	4.0
1960 Census	7.3	3.7	3.6	7.3	3.7	3.6	7.3	3.7	3.6	8.1	4.1	4.0	6.9	3.5	3.4	7.8	4.0	3.8
17-24 YEARS																		
Survey	10.1	3.9	6.2	6.6	2.0	4.6	19.6	10.7	8.9	9.2	2.9	6.3	7.6	2.3	5.3	7.7	2.2	5.5
1970 Census	14.2	7.1	7.1	14.1	7.2	6.9	14.2	7.1	7.1	15.7	8.3	7.4	14.3	7.1	7.2	13.1	6.3	6.8
1960 Census	11.2	5.6	5.6	11.2	5.8	5.4	10.9	5.2	5.7	12.7	6.7	6.0	11.1	5.6	5.5	10.4	5.0	5.4
25-34 YEARS																		
Survey	7.7	2.6	5.1	8.2	1.6	6.6	11.3	7.4	3.9	6.5	1.6	4.9	6.3	1.4	4.9	8.7	2.3	6.4
1970 Census	12.1	5.9	6.2	11.9	5.8	6.1	11.9	5.8	6.1	12.3	6.1	6.2	12.6	6.2	6.4	10.8	5.2	5.6
1960 Census	12.7	6.2	6.5	11.9	5.8	6.1	12.5	6.0	6.5	12.4	6.0	6.4	13.3	6.5	6.8	11.7	5.5	6.2
35-44 YEARS																		
Survey	8.2	2.8	5.4	8.6	2.9	5.7	11.2	6.8	4.4	6.4	1.4	5.0	8.0	2.1	5.9	9.4	2.7	6.7
1970 Census	11.0	5.3	5.7	10.9	5.3	5.6	10.8	5.2	5.6	11.1	5.3	5.8	11.4	5.5	5.9	11.1	5.2	5.9
1960 Census	12.6	6.1	6.5	12.3	6.0	6.3	12.2	5.9	6.3	12.6	6.1	6.5	12.8	6.3	6.5	12.8	6.1	6.7
45-54 YEARS																		
Survey	7.4	2.8	4.6	9.3	3.5	5.8	10.7	6.3	4.4	5.8	1.7	4.1	6.3	1.9	4.4	8.3	2.8	5.5
1970 Census	10.6	5.1	5.5	10.8	5.2	5.6	10.2	4.9	5.3	10.7	5.1	5.6	10.5	5.1	5.4	12.1	5.8	6.3
1960 Census	10.7	5.3	5.4	10.7	5.3	5.4	10.6	5.2	5.4	9.9	4.8	5.1	10.9	5.4	5.5	11.4	5.6	5.8
55-59 YEARS																		
Survey	3.6	1.4	2.2	4.3	1.9	2.4	4.5	2.7	1.8	2.8	0.9	1.9	3.4	1.1	2.3	5.0	1.4	3.6
1970 Census	4.6	2.2	2.4	4.8	2.3	2.5	4.4	2.1	2.3	4.4	2.1	2.3	4.6	2.2	2.4	5.5	2.6	2.9
1960 Census	4.3	2.1	2.2	4.5	2.2	2.3	4.3	2.1	2.2	3.6	1.7	1.9	4.4	2.2	2.2	4.7	2.3	2.4
>59 YEARS																		
Survey	10.4	4.6	5.8	14.6	6.6	8.0	10.7	5.7	5.0	7.3	2.8	4.5	10.3	4.6	5.7	14.2	6.1	8.1
1970 Census	13.8	6.5	7.3	14.9	6.6	8.3	12.3	5.3	7.0	11.1	4.6	6.5	12.8	5.6	7.2	16.0	7.2	8.8
1960 Census	11.5	5.3	6.2	13.5	6.3	7.2	10.8	4.9	5.9	9.2	4.0	5.2	11.3	5.2	6.1	13.3	6.5	6.8

Table 1B Appendix. *Comparison of the Age and Sex Distribution of Persons Attending Clinic with State Populations in 1960 and 1970 for High Income Ratio States—Ten-State Nutrition Survey (1968-1970)*

Age Group	Total			California			Massachusetts			Michigan			New York			Washington		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
TOTAL																		
Survey	100.0	43.5	56.6	100.0	42.1	58.0	100.0	44.2	55.7	100.0	42.8	57.1	100.0	46.3	53.7	100.0	44.1	55.9
1970 Census	100.0	48.6	51.7	100.0	49.2	50.7	100.0	47.8	52.2	100.0	48.9	51.0	100.0	48.5	51.6	100.0	49.6	50.2
1960 Census	100.0	49.0	50.7	100.0	49.7	50.3	100.0	48.2	51.6	100.0	49.5	50.4	100.0	48.5	51.7	100.0	50.4	49.6
<6 YEARS																		
Survey	15.6	7.9	7.7	16.3	8.0	8.3	14.4	7.5	6.9	16.0	9.0	7.0	14.1	7.4	6.7	16.1	7.9	8.2
1970 Census	10.2	5.2	5.0	10.0	5.1	4.9	10.2	5.2	5.0	11.0	5.6	5.4	10.4	5.3	5.1	10.0	5.1	4.9
1960 Census	13.0	6.6	6.4	13.2	6.7	6.5	12.7	6.5	6.2	14.8	7.5	7.3	12.0	6.1	5.9	13.3	6.8	6.5
6-9 YEARS																		
Survey	14.2	7.0	7.2	14.5	6.7	7.8	14.9	7.4	7.5	16.4	8.0	8.4	12.2	6.1	6.1	13.7	7.4	6.3
1970 Census	7.8	4.0	3.8	7.8	4.0	3.8	7.7	3.9	3.8	8.4	4.3	4.1	8.2	4.2	4.0	7.8	4.0	3.8
1960 Census	7.8	4.0	3.8	8.1	4.1	4.0	7.4	3.8	3.6	8.8	4.5	4.3	7.2	3.7	3.5	8.3	4.2	4.1
10-12 YEARS																		
Survey	10.1	5.2	4.9	9.9	5.1	4.8	10.8	5.7	5.1	13.2	6.4	6.8	9.3	5.0	4.3	9.0	4.6	4.4
1970 Census	6.1	3.1	3.0	5.9	3.0	2.9	5.9	3.0	2.9	6.7	3.4	3.3	6.4	3.3	3.1	6.2	3.2	3.0
1960 Census	5.5	2.8	2.7	5.7	2.9	2.8	5.3	2.7	2.6	6.1	3.1	3.0	5.2	2.6	2.6	6.1	3.1	3.0
13-16 YEARS																		
Survey	9.1	4.4	4.7	8.9	4.0	4.9	9.1	4.4	4.7	10.9	5.0	5.9	8.1	4.3	3.8	8.7	4.3	4.4
1970 Census	7.7	3.9	3.8	7.6	3.9	3.7	7.4	3.8	3.6	8.5	4.3	4.2	8.0	4.1	3.9	8.0	4.1	3.9
1960 Census	6.2	3.1	3.1	6.2	3.1	3.1	6.1	3.1	3.0	6.5	3.3	3.2	5.9	3.0	2.9	6.8	3.5	3.3
17-24 YEARS																		
Survey	10.1	3.6	6.5	9.4	3.5	5.9	11.3	3.8	7.5	6.4	1.9	4.5	8.6	3.5	5.1	12.3	4.1	8.2
1970 Census	13.5	6.6	6.9	14.1	7.1	7.0	13.5	6.4	7.1	13.5	6.5	7.0	12.5	6.0	6.5	14.4	7.3	7.1
1960 Census	9.8	4.8	5.0	10.4	5.4	5.0	9.9	4.8	5.1	9.8	4.6	5.2	9.4	4.4	5.0	10.2	5.2	5.0
25-34 YEARS																		
Survey	10.9	3.5	7.4	11.3	3.8	7.5	10.7	3.5	7.2	7.9	1.9	6.0	10.1	3.9	6.2	11.8	3.8	8.0
1970 Census	12.8	6.3	6.5	13.4	6.7	6.7	11.8	5.8	6.0	12.2	6.0	6.2	11.5	5.5	6.0	12.7	6.4	6.3
1960 Census	13.0	6.4	6.6	13.5	6.8	6.7	12.3	6.1	6.2	12.9	6.3	6.6	13.0	6.3	6.7	12.1	6.1	6.0
35-44 YEARS																		
Survey	8.8	3.3	5.5	8.9	3.1	5.8	9.8	3.8	6.0	7.9	2.2	5.7	10.0	4.2	5.8	7.2	3.1	4.1
1970 Census	11.7	5.7	6.0	11.8	5.8	6.0	11.0	5.4	5.6	11.3	5.5	5.8	12.0	5.8	6.2	10.9	5.4	5.5
1960 Census	14.1	6.9	7.2	14.5	7.2	7.3	13.5	6.5	7.0	13.6	6.7	6.9	14.1	6.7	7.4	13.6	6.8	6.8
45-54 YEARS																		
Survey	7.9	3.1	4.8	7.7	2.7	5.0	7.9	3.5	4.4	7.0	2.4	4.6	11.2	4.6	6.6	6.1	2.5	3.6
1970 Census	11.8	5.7	6.1	11.7	5.7	6.0	11.8	5.6	6.2	11.3	5.5	5.8	12.1	5.9	6.2	11.5	5.7	5.8
1960 Census	11.8	5.8	6.0	11.4	5.7	5.7	11.8	5.6	6.2	11.0	5.5	5.5	12.9	6.2	6.7	11.4	5.8	5.6
55-59 YEARS																		
Survey	3.1	1.3	1.8	2.8	1.0	1.8	3.1	1.4	1.7	3.0	1.2	1.8	4.1	1.8	2.3	3.2	1.6	1.6
1970 Census	5.0	2.4	2.6	4.7	2.3	2.4	5.1	2.4	2.7	4.7	2.3	2.4	5.0	2.4	2.6	4.9	2.4	2.5
1960 Census	4.9	2.4	2.5	4.5	2.2	2.3	5.1	2.4	2.7	4.5	2.3	2.2	5.6	2.7	2.9	4.5	2.3	2.2
>59 YEARS																		
Survey	10.3	4.2	6.1	10.4	4.2	6.2	7.9	3.2	4.7	11.2	4.8	6.4	12.3	5.5	6.8	11.9	4.8	7.1
1970 Census	13.7	5.7	8.0	12.9	5.6	7.3	15.6	6.3	9.3	12.3	5.5	6.8	14.0	6.0	8.0	13.4	6.0	7.4
1960 Census	13.6	6.2	7.4	12.5	5.6	6.9	15.7	6.7	9.0	11.9	5.7	6.2	14.9	6.8	8.1	13.7	6.6	7.1

Table 2A Appendix. *Comparison of the Age and Ethnic Group Distribution of Persons Attending Clinic with State Populations in 1970 for Low Income Ratio States—Ten-State Nutrition Survey (1968-1970)*

Age Group	Total			Kentucky			Louisiana			South Carolina			Texas			West Virginia		
	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black
TOTAL																		
Survey	100.0	38.3	61.7	100.0	81.2	18.8	100.0	25.2	74.6	100.0	8.4	91.7	100.0	23.8	76.1	100.0	89.8	10.2
1970 Census	100.0	84.0	15.9	100.0	92.8	7.2	100.0	69.9	29.9	100.0	69.5	30.5	100.0	87.5	12.5	100.0	96.1	3.9
<6 YEARS																		
Survey	14.6	4.5	10.1	12.8	9.5	3.3	14.5	2.8	11.7	16.1	0.9	15.2	15.4	2.6	12.8	12.6	11.1	1.5
1970 Census	10.8	8.7	2.1	10.3	9.5	0.8	11.7	7.5	4.2	11.1	7.0	4.1	10.9	9.2	1.7	9.7	9.3	0.4
6-9 YEARS																		
Survey	11.3	3.6	7.7	10.3	8.1	2.2	11.7	2.5	9.2	11.8	0.8	11.0	12.6	1.9	10.7	9.5	8.3	1.2
1970 Census	8.3	6.7	1.6	8.0	7.3	0.7	8.7	5.7	3.0	8.4	5.3	3.1	8.3	7.1	1.2	7.3	7.0	0.3
10-12 YEARS																		
Survey	8.6	2.8	5.8	7.9	6.5	1.4	9.2	2.1	7.1	9.4	0.6	8.8	7.8	1.4	6.4	7.3	6.1	1.2
1970 Census	6.4	5.2	1.2	6.2	5.7	0.5	6.8	4.4	2.4	6.6	4.1	2.5	6.4	5.5	0.9	6.1	5.8	0.3
13-16 YEARS																		
Survey	10.8	3.7	7.1	9.5	7.9	1.6	10.9	2.3	8.6	12.0	0.7	11.3	9.9	2.5	7.4	10.0	8.8	1.2
1970 Census	8.3	6.7	1.6	8.2	7.5	0.7	8.8	5.7	3.1	8.7	5.3	3.4	8.3	7.1	1.2	8.2	7.8	0.4
17-24 YEARS																		
Survey	12.3	4.4	7.9	10.6	8.7	1.9	11.9	2.2	9.7	14.0	1.1	12.9	9.7	2.5	7.2	13.1	11.7	1.4
1970 Census	14.3	12.0	2.3	14.1	13.0	1.1	14.2	9.9	4.3	15.7	11.0	4.7	14.2	12.4	1.8	13.2	12.7	0.5
25-34 YEARS																		
Survey	9.1	3.9	5.2	9.7	7.7	2.0	9.0	2.7	6.3	8.1	0.8	7.3	9.3	1.9	7.4	10.4	9.7	0.7
1970 Census	12.2	10.5	1.7	11.8	11.1	0.7	11.9	8.8	3.1	12.3	9.3	3.0	12.5	11.1	1.4	10.8	10.5	0.3
35-44 YEARS																		
Survey	9.1	4.0	5.1	10.5	8.5	2.0	8.8	2.6	6.2	7.7	0.8	6.9	10.1	2.4	7.7	10.3	9.5	0.8
1970 Census	11.1	9.6	1.5	10.9	10.2	0.7	10.8	8.1	2.7	11.1	8.3	2.8	11.4	10.1	1.3	11.1	10.8	0.3
45-54 YEARS																		
Survey	8.5	3.9	4.6	9.9	8.3	1.6	8.7	3.0	5.7	7.9	0.9	7.0	7.6	2.6	5.0	9.3	8.5	0.8
1970 Census	10.7	9.3	1.4	10.9	10.2	0.7	10.2	7.7	2.5	10.7	8.0	2.7	10.6	9.5	1.1	12.1	11.7	0.4
55-59 YEARS																		
Survey	4.1	1.9	2.2	4.8	4.1	0.7	4.0	1.4	2.6	3.5	0.4	3.1	4.1	1.2	2.9	4.6	4.3	0.3
1970 Census	4.6	4.0	0.6	4.8	4.5	0.3	4.4	3.3	1.1	4.4	3.2	1.2	4.6	4.1	0.5	5.5	5.3	0.2
>59 YEARS																		
Survey	11.6	5.6	6.0	14.0	11.9	2.1	11.1	3.6	7.5	9.6	1.4	8.2	13.4	4.8	8.6	12.9	11.8	1.1
1970 Census	13.2	11.3	1.9	14.8	13.8	1.0	12.3	8.8	3.5	11.0	8.0	3.0	12.8	11.4	1.4	16.0	15.2	0.8

Table 2B Appendix. *Comparison of the Age and Ethnic Group Distribution of Persons Attending Clinic with State Populations in 1970 for High Income Ratio States—Ten-State Nutrition Survey (1968-1970)*

Age Group	Total			California			Massachusetts			Michigan			New York			Washington		
	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black
TOTAL																		
Survey	100.0	74.5	25.5	100.0	70.5	29.5	100.0	86.1	13.9	100.0	51.1	48.8	100.0	64.7	35.2	100.0	94.4	5.6
1970 Census	100.0	91.3	8.6	100.0	92.8	7.3	100.0	96.8	3.1	100.0	88.7	11.2	100.0	88.1	12.0	100.0	97.9	2.2
<6 YEARS																		
Survey	13.4	9.3	4.1	12.8	8.6	4.2	13.4	10.7	2.7	15.0	7.2	7.8	12.8	7.0	5.8	13.3	12.4	0.9
1970 Census	10.2	9.0	1.2	10.0	9.0	1.0	10.1	9.6	0.5	11.0	9.5	1.5	9.9	8.3	1.6	9.9	9.6	0.3
6-9 YEARS																		
Survey	10.3	7.2	3.1	8.9	5.7	3.2	11.2	9.5	1.7	11.7	5.3	6.4	9.9	5.4	4.5	10.3	9.6	0.7
1970 Census	7.7	6.9	0.8	7.8	7.1	0.7	7.7	7.4	0.3	8.4	7.4	1.0	7.4	6.3	1.1	7.8	7.6	0.2
10-12 YEARS																		
Survey	7.5	5.2	2.3	6.3	3.9	2.4	8.2	7.2	1.0	9.5	4.2	5.3	7.1	4.0	3.1	6.7	6.3	0.4
1970 Census	6.0	5.4	0.6	5.9	5.4	0.5	5.9	5.7	0.2	6.7	5.9	0.8	5.7	4.9	0.8	6.2	6.0	0.2
13-16 YEARS																		
Survey	8.6	6.0	2.6	8.1	4.9	3.2	8.9	7.6	1.3	9.8	4.7	5.1	8.3	4.9	3.4	8.2	7.6	0.6
1970 Census	7.6	6.9	0.7	7.6	7.0	0.6	7.5	7.2	0.3	8.6	7.5	1.1	7.3	6.3	1.0	8.0	7.8	0.2
17-24 YEARS																		
Survey	13.9	10.4	3.5	13.9	10.2	3.7	14.6	12.1	2.5	12.0	6.2	5.8	12.7	8.0	4.7	16.0	15.0	1.0
1970 Census	13.4	12.2	1.2	14.1	13.0	1.1	13.6	13.1	0.5	13.5	11.9	1.6	12.6	11.0	1.6	14.4	14.0	0.4
25-34 YEARS																		
Survey	11.7	8.9	2.8	12.4	9.4	3.0	11.6	9.8	1.8	10.2	5.7	4.5	11.3	6.8	4.5	13.0	12.4	0.6
1970 Census	12.6	11.4	1.2	13.3	12.3	1.0	11.6	11.2	0.4	12.2	10.8	1.4	12.3	10.5	1.8	12.7	12.4	0.3
35-44 YEARS																		
Survey	9.6	7.1	2.5	9.0	6.1	2.9	10.4	9.0	1.4	9.5	4.6	4.9	10.1	6.8	3.3	8.5	8.0	0.5
1970 Census	11.5	10.5	1.0	11.7	10.9	0.8	11.0	10.7	0.3	11.3	10.0	1.3	11.8	10.3	1.5	10.9	10.7	0.2
45-54 YEARS																		
Survey	9.0	7.0	2.0	9.2	6.4	2.8	8.8	8.0	0.8	8.3	4.8	3.5	10.4	7.6	2.8	7.8	7.5	0.3
1970 Census	11.8	10.9	0.9	11.8	11.1	0.7	11.8	11.5	0.3	11.3	10.2	1.1	12.1	10.9	1.2	11.6	11.4	0.2
55-59 YEARS																		
Survey	3.8	3.0	0.8	4.5	3.0	1.5	3.5	3.3	0.2	3.4	2.0	1.4	4.1	3.2	0.9	3.5	3.3	0.2
1970 Census	5.0	4.7	0.3	4.8	4.5	0.3	5.1	5.0	0.1	4.6	4.2	0.4	5.4	5.0	0.4	5.0	4.9	0.1
>59 YEARS																		
Survey	12.1	10.3	1.8	14.9	12.3	2.6	9.4	8.9	0.5	10.5	6.4	4.1	13.2	11.0	2.2	12.7	12.3	0.4
1970 Census	14.1	13.4	0.7	13.1	12.5	0.6	15.6	15.4	0.2	12.3	11.3	1.0	15.6	14.6	1.0	13.6	13.5	0.1

Table 3 Appendix. *Distribution of Families by Poverty Income Ratio Groups and Ethnic Groups for Low Income Ratio States and High Income Ratio States—Ten-State Nutrition Survey (1968-1970)*

LOW INCOME RATIO STATES

Ethnic Group	Poverty Income Ratio Group									
	Total	<.50	.50-.99	1.00-1.49	1.50-1.99	2.00-2.49	2.50-2.99	3.00-3.49	3.50-3.99	>3.99
Total										
Number	3995	1064	1413	650	333	185	117	66	47	120
Percent	100.0	26.6	35.4	16.3	8.3	4.6	2.9	1.7	1.2	3.0
White										
Number	1373	225	370	264	159	119	78	42	31	85
Percent	100.0	16.4	26.9	19.2	11.6	8.7	5.7	3.1	2.3	6.2
Black										
Number	2127	702	843	296	143	53	28	20	12	30
Percent	100.0	33.0	39.6	13.9	6.7	2.5	1.3	0.9	0.6	1.4
Spanish American										
Number	474	133	192	85	29	12	10	4	4	5
Percent	100.0	28.1	40.5	17.9	6.1	2.5	2.1	0.8	0.8	1.1
Oriental										
Number	2	0	1	0	1	0	0	0	0	0
Percent	100.0	0.0	50.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0
American Indian										
Number	9	2	3	3	1	0	0	0	0	0
Percent	100.0	22.2	33.3	33.3	11.1	0.0	0.0	0.0	0.0	0.0
Unknown										
Number	10	2	4	1	1	1	1	0	0	0
Percent	100.0	20.0	40.0	10.0	10.0	10.0	10.0	0.0	0.0	0.0

HIGH INCOME RATIO STATES

Ethnic Group	Poverty Income Ratio Group									
	Total	<.50	.50-.99	1.00-1.49	1.50-1.99	2.00-2.49	2.50-2.99	3.00-3.49	3.50-3.99	>3.99
Total										
Number	9237	475	1682	1905	1338	1047	747	573	401	1069
Percent	100.0	5.1	18.2	20.6	14.5	11.3	8.1	6.2	4.3	11.6
White										
Number	6106	291	912	1079	881	729	551	449	312	902
Percent	100.0	4.8	14.9	17.7	14.4	11.9	9.0	7.4	5.1	14.8
Black										
Number	1758	105	416	428	249	180	124	81	54	121
Percent	100.0	6.0	23.7	24.3	14.2	10.2	7.1	4.6	3.1	6.9
Spanish American										
Number	1060	46	290	327	165	98	49	31	24	30
Percent	100.0	4.3	27.4	30.8	15.6	9.2	4.6	2.9	2.3	2.8
Oriental										
Number	158	10	26	37	22	24	11	8	9	11
Percent	100.0	6.3	16.5	23.4	13.9	15.2	7.0	5.1	5.7	7.0
American Indian										
Number	135	21	36	31	16	14	9	3	2	3
Percent	100.0	15.6	26.7	23.0	11.9	10.4	6.7	2.2	1.5	2.2
Unknown										
Number	20	2	2	3	5	2	3	1	0	2
Percent	100.0	10.0	10.0	15.0	25.0	10.0	15.0	5.0	0.0	10.0

Table 4A Appendix. *Distribution of Families by Number of Persons Less Than Seventeen Years of Age and by Ethnic Groups for Low Income Ratio States—Ten-State Nutrition Survey (1968-1970)*

Number of Persons <17 Years of Age	Total [1]			Ethnic Group								
				White			Black			Spanish American		
	Number	Percent	Mean PIR	Number	Percent	Mean PIR	Number	Percent	Mean PIR	Number	Percent	Mean PIR
Total	3805	100.0	1.14	1246	100.0	1.64	2064	100.0	0.89	474	100.0	0.94
None	1367	35.9	1.35	576	46.2	1.76	673	32.6	1.02	111	23.4	1.23
One	529	13.9	1.28	193	15.5	1.73	261	12.6	0.99	72	15.2	1.11
Two	508	13.4	1.31	175	14.0	1.87	257	12.5	1.02	73	15.4	0.94
Three	375	9.9	1.00	117	9.4	1.42	204	9.9	0.81	51	10.8	0.82
Four	355	9.3	0.91	93	7.5	1.21	211	10.2	0.76	50	10.5	1.01
Five	265	7.0	0.73	50	4.0	1.08	169	8.2	0.66	46	9.7	0.62
Six	179	4.7	0.64	19	1.5	0.88	135	6.5	0.62	23	4.9	0.58
Seven	87	2.3	0.67	16	1.3	0.81	58	2.8	0.63	12	2.5	0.68
Eight	71	1.9	0.61	4	0.3	0.63	49	2.4	0.64	17	3.6	0.54
Nine	41	1.1	0.60	3	0.2	0.37	29	1.4	0.65	9	1.9	0.53
Ten	12	0.3	0.74	—	—	—	10	0.5	0.75	2	0.4	0.70
Eleven+	16	0.4	0.58	—	—	—	8	0.4	0.68	8	1.7	0.48

[1] Total includes American Indian, Oriental and unknown ethnic groups.

Table 4B Appendix. *Distribution of Families by Number of Persons Less Than Seventeen Years of Age and by Ethnic Groups for High Income Ratio States—Ten-State Nutrition Survey (1968-1970)*

Number of Persons <17 Years of Age	Total [1]			Ethnic Group								
				White			Black			Spanish American		
	Number	Percent	Mean PIR	Number	Percent	Mean PIR	Number	Percent	Mean PIR	Number	Percent	Mean PIR
Total	7286	100.0	2.21	5055	100.0	2.47	1177	100.0	1.74	794	100.0	1.49
None	3464	47.5	2.49	2729	54.0	2.63	441	37.5	2.07	211	26.6	1.83
One	899	12.3	2.57	573	11.3	2.93	176	15.0	2.03	119	15.0	1.71
Two	964	13.2	2.19	643	12.7	2.47	152	12.9	1.72	129	16.2	1.49
Three	743	10.2	1.85	470	9.3	2.09	132	11.2	1.44	108	13.6	1.43
Four	495	6.8	1.54	295	5.8	1.74	93	7.9	1.32	82	10.3	1.18
Five	324	4.4	1.37	179	3.5	1.60	65	5.5	1.12	63	7.9	1.01
Six	192	2.6	1.27	89	1.8	1.47	51	4.3	1.06	36	4.5	1.10
Seven	109	1.5	1.28	50	1.0	1.52	30	2.5	1.10	20	2.5	0.92
Eight	55	0.8	1.28	15	0.3	1.72	21	1.8	1.17	13	1.6	1.11
Nine	27	0.4	1.24	10	0.2	1.47	10	0.8	1.21	7	0.9	0.98
Ten	8	0.1	1.12	—	—	—	5	0.4	1.21	3	0.4	0.97
Eleven+	6	0.1	1.27	2	0.0	1.51	1	0.1	1.42	3	0.4	1.06

[1] Total includes American Indian, Oriental and unknown ethnic groups.

Figure 1a Appendix—Percentage Distribution of White, Black, Spanish American Families in California by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)

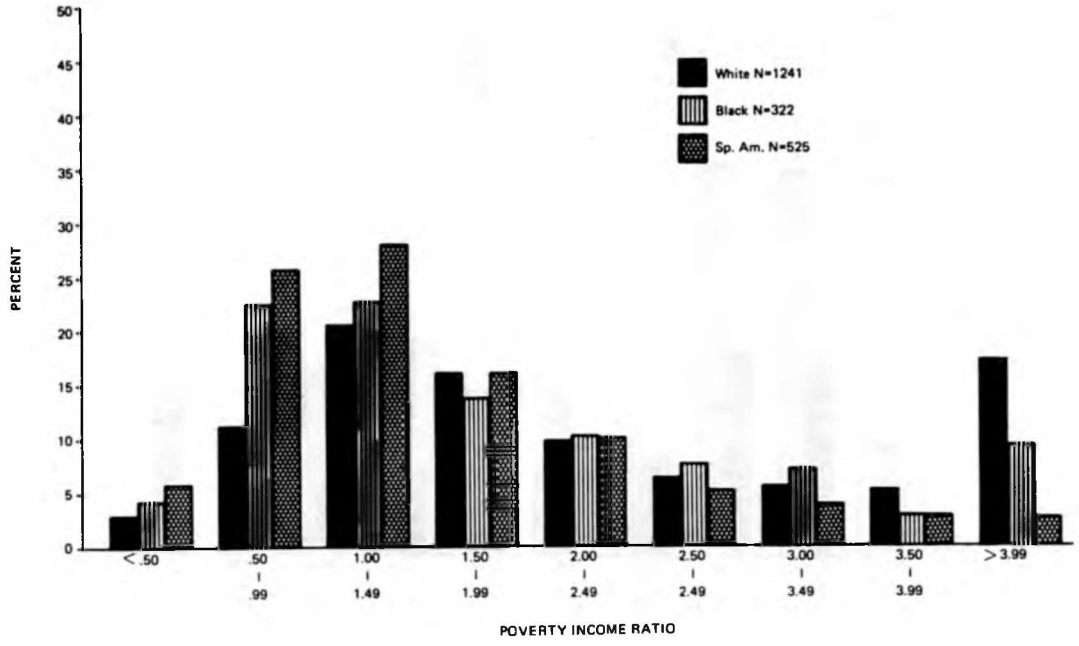


Figure 1b Appendix—Percentage Distribution of White and Black Families in Kentucky by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)

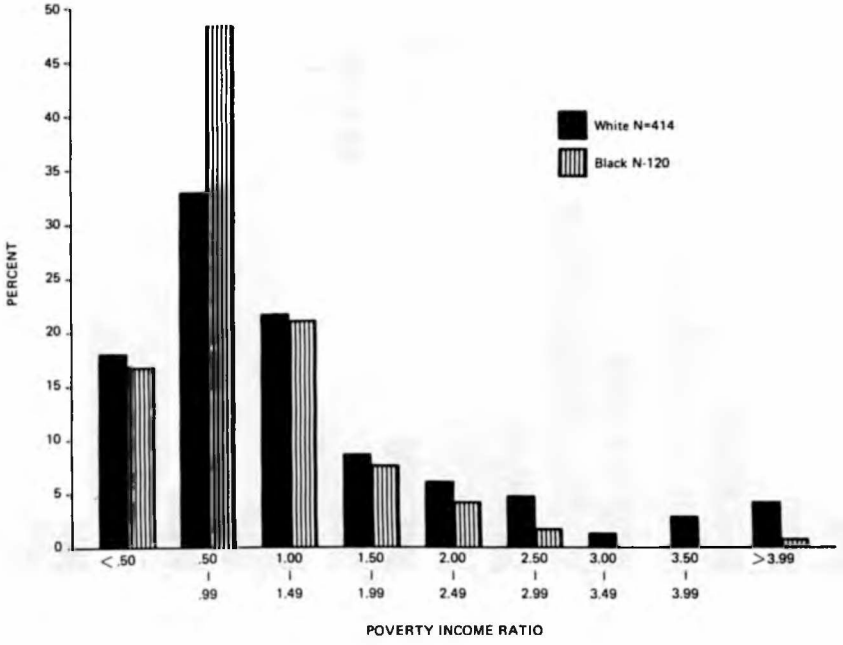


Figure 1c Appendix—Percentage Distribution of White and Black Families in Louisiana by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)

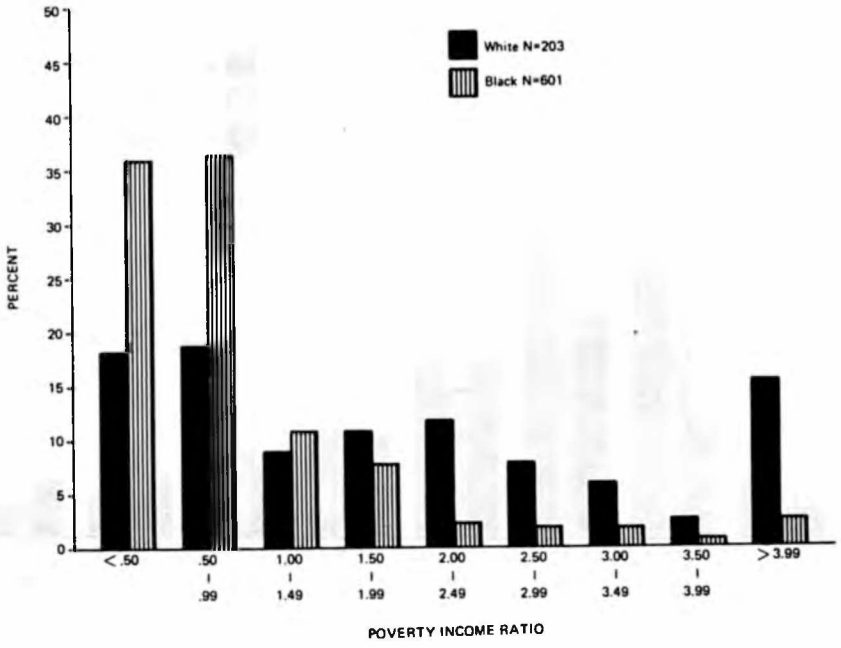


Figure 1d Appendix—Percentage Distribution of White, Black, and Spanish American Families in Massachusetts by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)

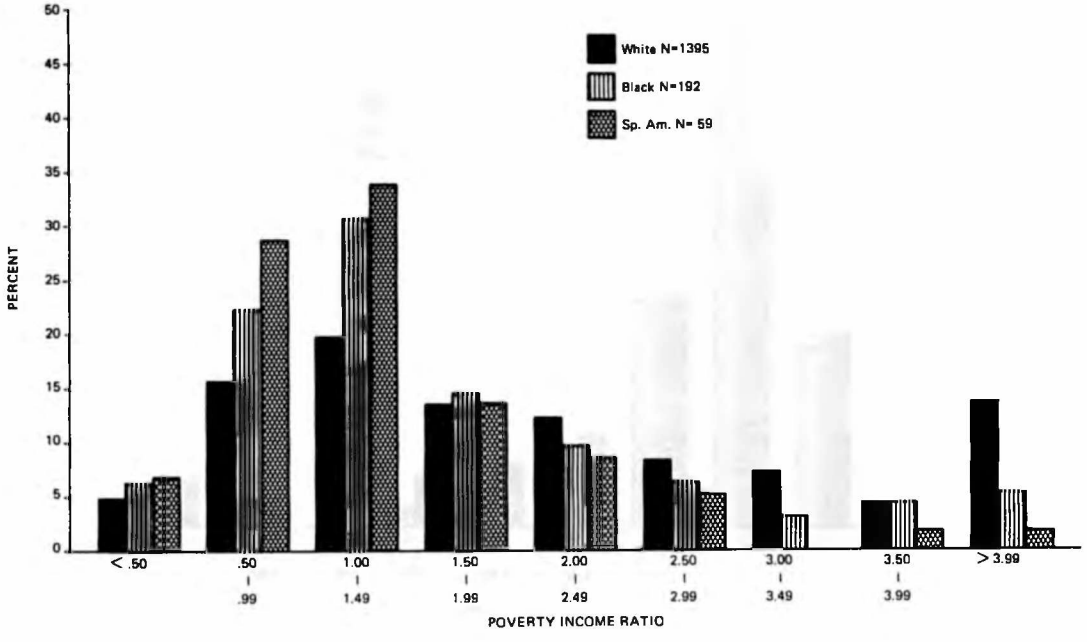


Figure 1e Appendix—Percentage Distribution of White and Black Families in Michigan by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)

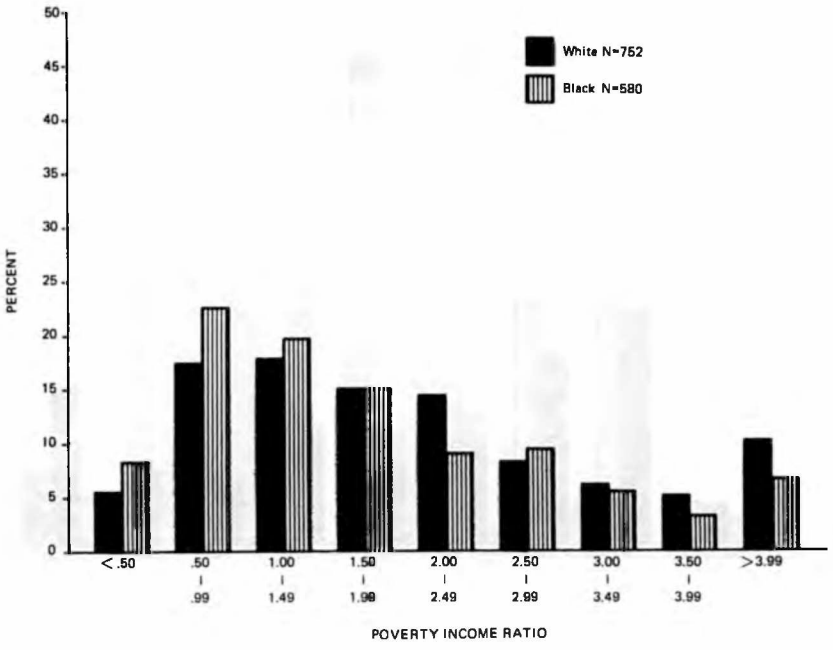


Figure 1f Appendix—Percentage Distribution of White, Black, and Spanish American Families in New York City by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)

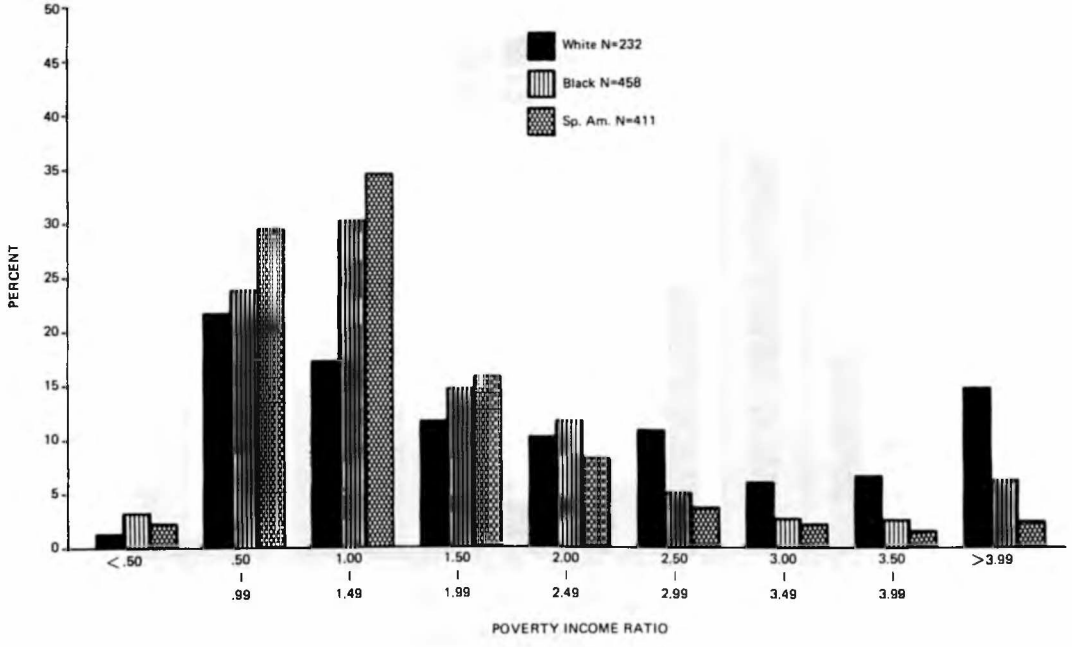


Figure 1g Appendix—Percentage Distribution of White and Black Families in New York State by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)

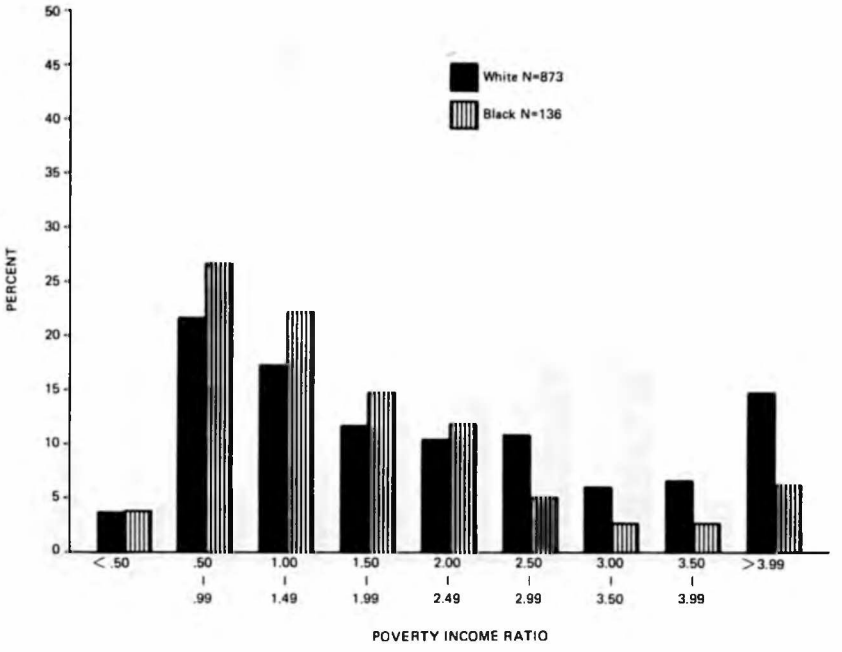


Figure 1h Appendix—Percentage Distribution of White and Black Families in South Carolina by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)

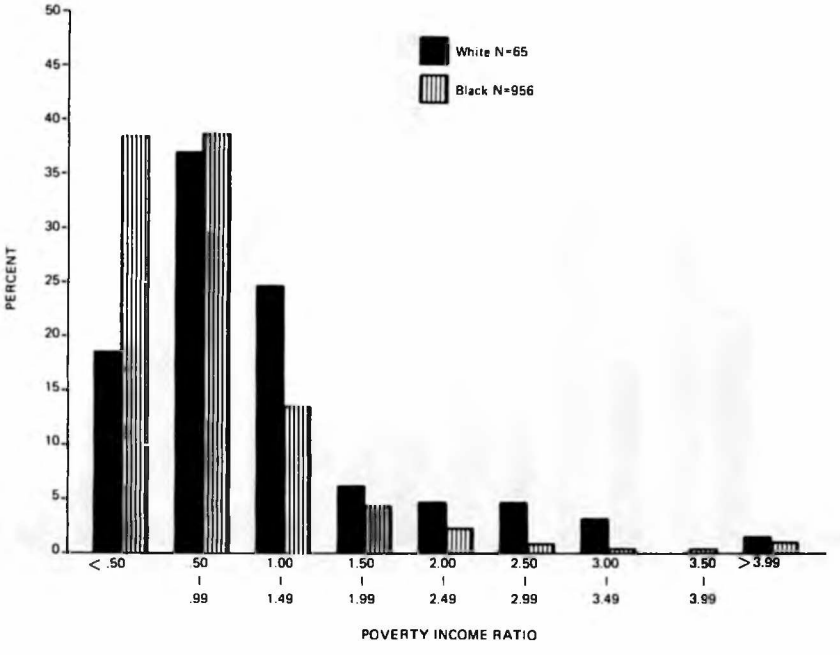


Figure 1i Appendix—Percentage Distribution of White, Black, and Spanish American Families in Texas by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)

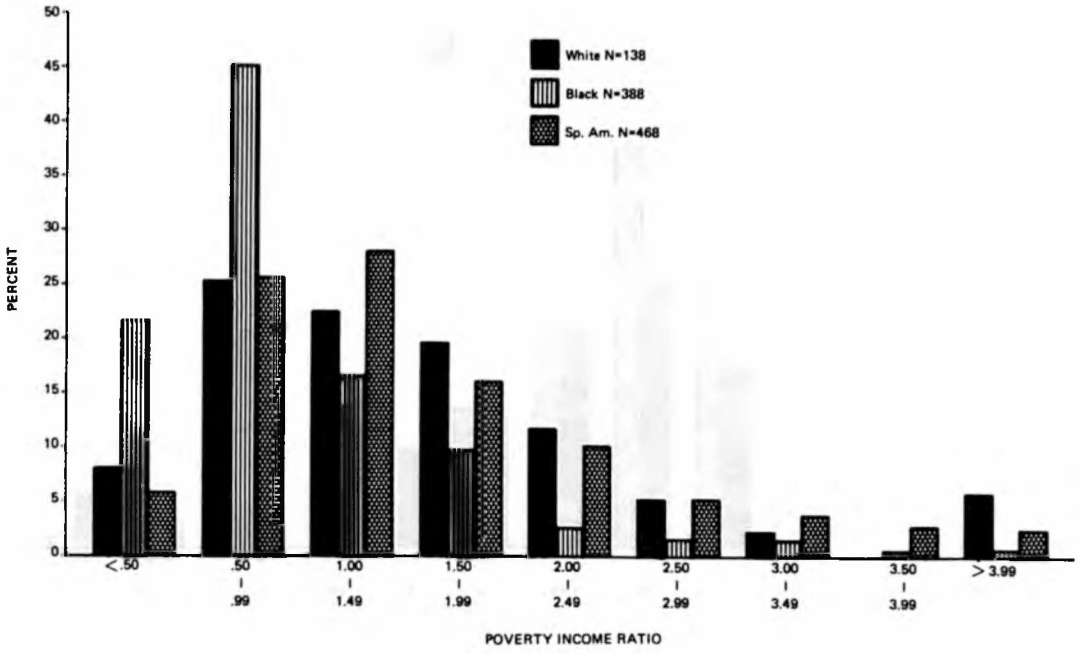


Figure 1j Appendix—Percentage Distribution of White and Black Families in Washington by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)

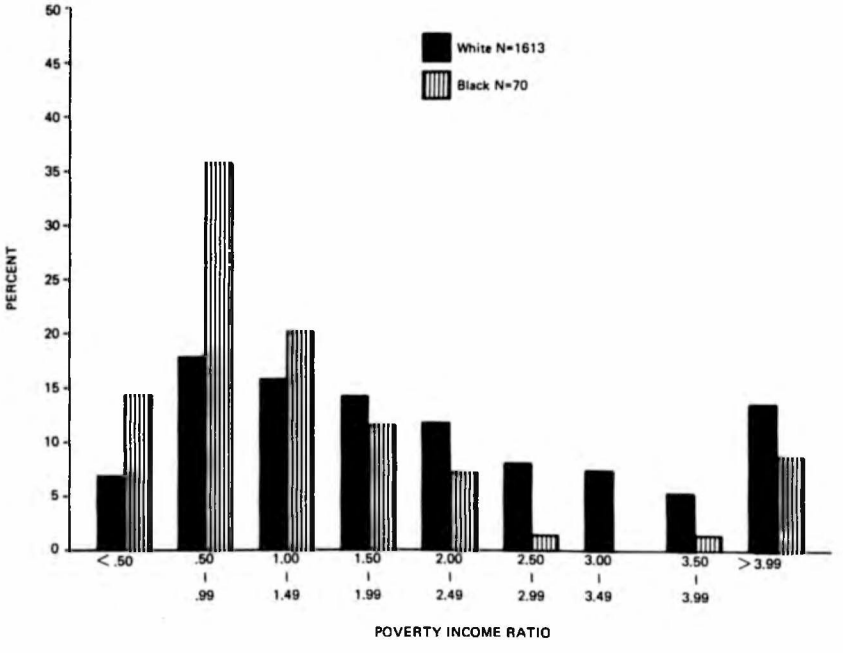


Figure 1k Appendix—Percentage Distribution of White and Black Families in West Virginia by Poverty Income Ratio—Ten-State Nutrition Survey (1968-1970)